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Utility and City Prosperity Go Hand-in-Hand

A NEW YORK CITY official recently justified the operating loss on the municipal trackless trolleys in Staten Island by the plea that the city will get back in increased taxes because of higher land values many times the loss in operating costs. Very likely this is true. This increase in value of real estate is a recognized byproduct of the operation of every public utility. Without their supply of transportation, electric light, water or gas, land otherwise suitable for building purposes is of much less value. Every city gains as the service of its utilities improves in quality and in the extent of the territory supplied.

But if this is so, why do so many municipalities act as if any prosperity of its local utilities is gained only at the expense of the citizens? Why, in New York for instance, does additional transit in Staten Island deserve a subsidy, while in the other four boroughs transportation has had to be decreased because the city failed to co-operate in helping to promote good transportation? The neglect of the city in providing the repair facilities for the rapid transit cars called for under the contract between the I. R. T. and the city is a case in point.

These are questions which the New York City administration can well answer. And there are other cities where the lesson of this close connection between city and utility prosperity is still to be learned.

Salaries Again—What Poor Salaries May Mean

EXAMPLES of underpay of men of the electric railway field, particularly the master mechanics, of which the JOURNAL has spoken frequently of late, keep coming to the attention of the paper. Perhaps all of them ought to be cited to impress the fallacy of one of the things that is holding the industry back. One instance, which shows more definitely than common what this policy means, follows:

Three years ago the master mechanic on a small city property operating some forty cars came to the manager and said he simply must have more money. He was making $2,500, had a family, and the high prices of necessities were pressing him hard. He was a competent man and was keeping the cars up to a high standard of repair. But the manager would not consent even to the $500 increase that would satisfy the man.

He quit—as he should have done. Subsequently this same manager replaced him with an inferior man whom he paid $3,600. The condition of the cars has steadily gone down, until today, a new manager who is about to make a change in this department, estimates that at the very least it has cost this company $200,000 in excessive maintenance expense, not to mention the losses of patronage from irregularities and failures of service, because that former master mechanic was let go.

Such decisions about the salaries of those men in responsible positions who have demonstrated their ability and in whom the company has the invaluable asset of experience on the property are evidence that no real thought is given the matter.

The JOURNAL is going to have more to say about this subject, because it believes that it points to the remedy for one ailment of the industry which goes right to the root of things. It is impossible to get 100 per cent heart and head interest in the work when the man carrying the responsibility is sadly underpaid, and knows it, and is spending half his time trying to find a way to jump to another field.

N. & W. Electrification Has Contributed Notably to Knowledge in this Field

ALTHOUGH it was not one of the earliest steam railroad electrifications, that on the Norfolk & Western Railway was a pioneer in several important respects. It was the first to demonstrate on a large scale the real abilitiy of electric operation to increase track capacity in the movement of heavy freight trains up long, steep grades. It was the first to prove that constant-speed motors can be supplied from a single-phase distribution circuit under the difficult conditions imposed by everyday service on an important freight-carrying railroad.

At the present day it requires a stretch of the imagination to picture the phase converter as it was ten years ago. The underlying principles upon which its operation depends were, of course, well known. But as a piece of laboratory apparatus it was merely of interest, and that is about all. There had not previously been any considerable commercial demand for a machine to convert single-phase into polyphase power. Ten years ago the demand materialized all at once and on a large scale. The result was highly creditable to the scientific knowledge and designing skill of the time, for the phase converter has proved to be one of the most reliable and effective parts of the N. & W. locomotives. The only important change in design, which will be incorporated in the locomotives now building, is in the use of the synchronous, in place of the induction principle in the phase converting apparatus. This is not a fundamental change, and it is simply for the purpose of improving the power factor. The slight extra complication in the excitation is believed to be offset by the better effect on the power circuit.

Being a pioneer, the N. & W. found it necessary to solve a number of problems. The solutions are now available to other roads contemplating electrification. They will, for example, save the Virginian Railway much expense and difficulty. Locomotives for service such as that involved in hauling 3,000-ton trains up 2

per cent grades at 14 m.p.h. will hereafter be built more ruggedly than the first N. & W. machines because the test of time has shown where the weak points were. This is perhaps the greatest contribution to the development of the art of heavy electric railroading that the N. & W. has made.

A visitor to the N. & W. electrified zone is impressed by the matter-of-fact way in which the electric engines perform their work, and by their general inconspicuousness. All evidences of experiment are gone. The electrification as a whole functions like a well-oiled machine. Like so many of the electrification projects, heralded as great achievements and arousing greatest interest at their instigation, it plays its part in trunk line operation so well that its existence is almost forgotten by the general public and even by steam road men. In fact, the mileage electrified has been nearly doubled since the original installation, almost without any general cognizance of the extension. The article in this issue brings the N. & W. project back to mind and relates an intimate account of the results that are being obtained, as found by one of the JOURNAL editors after spending a week in the electrified zone.

The "Journal" Placed on the "Index Librorum Prohibitorum"

LAST week this paper printed an editorial to which the president of the company directly concerned took exception by telephone. Later by a written communication he discontinued all that company's subscriptions to the JOURNAL. He was invited to make use of the JOURNAL pages to express his views, if he thought the editorial unfair in any respect, but has not responded.

Since the JOURNAL is thus placed on the "Index Librorum Prohibitorum" for the men of this company, because of what was printed, perhaps the reason for the editorial should be stated.

The burden of last week's editorial was that the company in question had embarked on what appeared to be a dangerous experiment from the standpoint of the industry. In so expressing its own view, the JOURNAL, which aims to reflect also the best opinion of the industry it champions, naturally puts the interests of that industry as it sees them above the acts or interests of any individual company, where these seem to be running counter. It was thought that the shutdown of this property was a matter of great concern to the industry, for the reasons, among others, set forth in the previous editorial, and the developments up to Thursday night of this week have not changed this opinion.

A Reflex Benefit of the Merchandising Transportation Movement

SALESMANSHIP, in order to be most effective, must have to do with commodities or services which are first class in quality and well adapted to the needs of the prospective purchaser. This principle applies in selling electric railway car rides, as well as typewriters, automobiles or dry goods. No self-respecting salesman can afford to exert his efforts in selling things with which his customers will be dissatisfied. To do good work he must first convince himself or be convinced that the community in which he sells will be benefited by purchasing his wares.

Of late years the electric railways have been directing increased energy in salesmanship to meet private automobile and bus competition. They did not do much along this line until the competition became threatening. Coincident with the developing of merchandising plans, the qualities of the product of the competitors had to be studied, in order that all aspects of the competition might be met, as far as possible. This in turn caused a study of the qualities of the transportation service which the railways were already rendering, with a view to seeing if it could be improved and hence more readily sold. This reflex action has been highly beneficial; in fact, to it may be attributed some of the principal improvements which have come about recently in electric railway service, especially those affecting speed, and those affecting passenger comfort, convenience and safety.

The above qualities are usually summarized as "good service"; good service being service that the public wants and will consider good if furnished, rather than what the manager finds it most convenient and profitable to give. The present concentration of effort in merchandising transportation has tended to standardize the quality of good service. Once a railway is sure that, measured by modern requirements, it is giving good service, it may properly and profitably talk more about it.

Temporary Traffic Stimulators Are Not Good Business

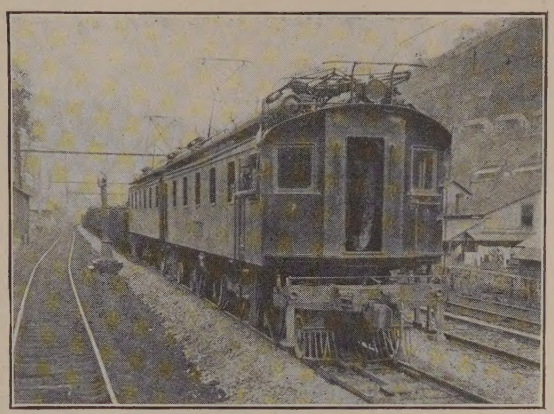
THE article in the July 14 issue on "Selling Transportation in 1890" should be a reminder to the present-day operator that blanket transportation is not so new as some people imagine, and that no one need be afraid of it. Indeed, while the season ticket was but a sporadic phenomenon in this country it has been a matter of course abroad almost from the first days of railroading.

The experience of Mr. Owen's company in the far-away days of 1877 is not without a lesson for us now. His company covered a great deal of ground in going from 7 cents to 5 cents with six tickets for 25 cents in single-trip fares and in putting on passes that ran from one month to a lifetime. Apparently, he started off with a proper analysis, but the successive changes in rates, and especially in allowing unlimited riding for $1 a month, indicate that the company did not understand or follow the economic principle involved in the weekly pass. This principle is that the purchaser of a pass must pay a price equivalent to at least two standard or ticket fares a day, so that his reduction in rate is obtained only through the addition of non-rush rides that generally are available without an increase in the amount of service.

Probably the writer of the paper has gone to a realm where each inhabitant is supplied free of charge with self-contained, high-speed transportation, so he would consider futile any argument on his conclusion that traffic stimulators should be regarded only as temporary expedients. This is true enough of special excursion rates, and the like, but it is not true of plans like short-haul fares, off-peak rates, the monthly card and the weekly pass. There is ample experience to show that if such stimulators are removed, riding and revenue fall down to the old levels with striking swiftness. Therefore, the motto should be, in the words of Davy Crockett, "Be sure you're right, then go ahead," and make your patrons feel that you will stay put so long as no radical changes occur in costs.

A Decade of the N. & W. Electrification

Operating Experience Has Led to Minor Changes in Original Designs—Electrified Mileage Has Been Doubled Since the First Project Was Completed—Some of the Methods of the Transportation and Other Operating Departments Are Described



Three of These Mallets Could Not Do What Two Electrics Do on the N. & W.

MANY changes have taken place since the Norfolk & Western Railway made its decision ten years ago to electrify the section over the divide in the Blue Ridge Mountains between Virginia and the southern part of West Virginia, about 360 miles from the Atlantic Ocean. Originally the plan was to electrify the line from Bluefield to Eckman Yards, but before the work actually was done an extension a few miles farther to Kimball was authorized. The route distance from Bluefield to Kimball is 27½ miles, or 1½ miles longer by way of a detour between Cooper and Bluestone Junction.

The total single-track mileage involved in the first electric installation was approximately 108, the road being double-tracked except for a section of slightly more than 3,000 ft. through the Coaldale tunnel, and for the detour between Bluestone Junction and Cooper. There also are numerous yards and sidings in the electrification.

Success of Electric Operation Attested by Consistent Extension Program

Hardly was the original installation completed when the process of expansion began, and it is now proceeding rapidly. In 1915 and 1916 the 5 miles of route between Bluestone Junction and Clift Yard were electrified, as well as a mile between Bluestone Junction and Pocahontas.

Just prior to the war an extension of the electrification westward from Kimball was started, including the main line to Farm and a single-track branch from Welch to Wilcoe Yard. Unfortunately this project, which comprised 51 miles of single track, was interrupted by the war, but since the armistice the work has been pushed to completion.

Even before the Wilcoe-Farm extension was finished, the directors of the company voted to continue the electrical installation westward to Iaeger. The Farm-Iaeger project, now being constructed under the direction of Gibbs & Hill, New York, involves a route mileage of 22, and a total of 50 equivalent single-track miles. With the extension just completed the mileage of the original installation will be nearly doubled.

Features of the Overhead Construction

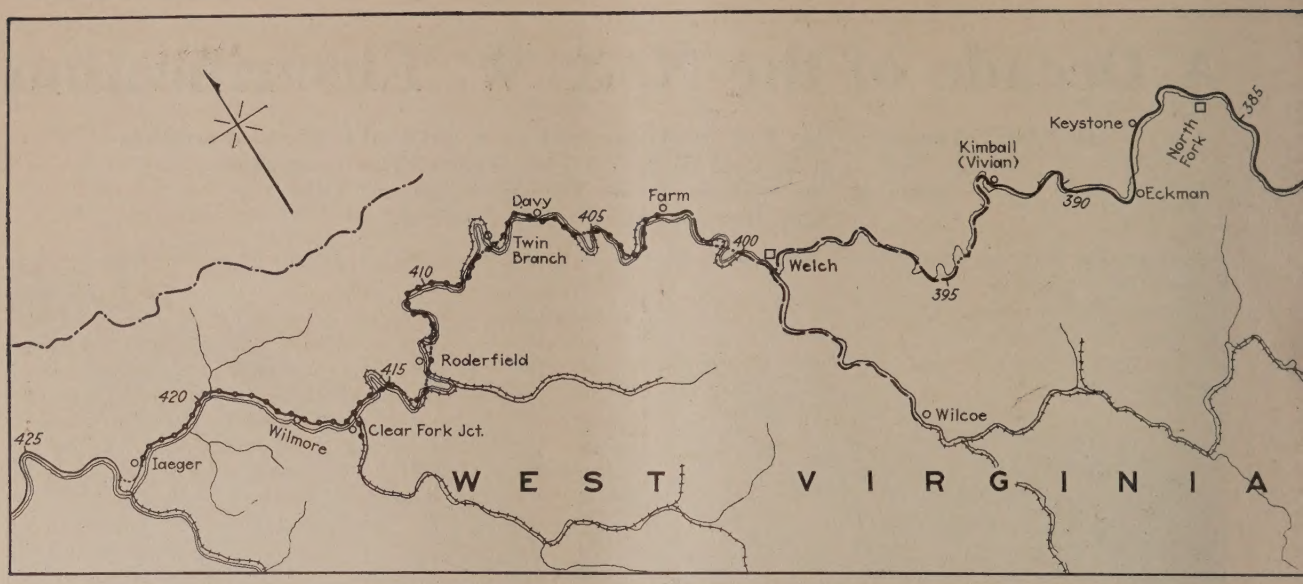
In general the overhead construction in the new work will follow the lines adopted earlier, but a few changes have been made in details. Instead of tubular poles, columns of H-section will be used. These will be of four sizes, 12 in. x 12 in., 10 in. x 10 in., 8 in. x 8 in., or 6 x 6 in., as conditions may require. The columns will be supported on steel base plates bolted to concrete foundations.

The cross-members will be of H-section as in the original installation. On the Wilcoe-Farm extension the cross-members were made up of two angles riveted together to form a T, with spacers between the vertical sides. This was done because it was impracticable to obtain H-section steel during the war, although the latter is preferable as it is more substantial and is easier to keep painted.

The guys will be of strand in place of the rods used earlier. Each will terminate at the ground end in a threaded rod to which it will be connected by a turnbuckle. The sockets to which the strand will be attached directly will have extra large baskets. Tests have shown that the strand will break before it will pull out of a socket.

The guy anchor or "dead man" to which the threaded rod will be attached will be of concrete, and a sleeve of iron pipe will be slipped over the lower part of the strand to protect it and the rod. It is planned to pre-cast the guy anchors at a central point and haul them to the job, whereas in the earlier work they were cast in the field.

Suspension insulators will be used for supporting the messenger wire wherever possible, even in the tunnels. In the tunnels, however, it will be necessary to employ pin-type insulators on the insides of the curves. The hangers will be made extra long to allow of shortening



The Several Steps in the N. & W. Electrification from Bluefield to Iaeger Are

to maintain vertical clearance, as mentioned elsewhere in this article.

Practically all the fittings used in the tunnels will be of bronze to prevent corrosion. This will extend to the messenger, which will be of extra high strength bronze.

Some Changes in Overhead Found Desirable

It was expected at the start that changes would have to be made in the construction, as the Norfolk & Western was a pioneer electrification. For example, soon after operation was commenced it was found that the No. 00 hard-drawn copper auxiliary messenger wire which supports the contact line, and the contact wire itself, which was of No. 000 bronze, were overheated on the heavy grades. To remedy this a second auxiliary messenger, similar to the first, was added at certain points.

An interesting modification in the overhead construction has been made necessary by the steady rise in the track elevation, which has averaged about 1 in. per year. This rise is caused by the inclusion with the ballast of a large amount of coal dust dropped from the cars. It has been found difficult and expensive to separate this by forking or other ordinary maintenance method, the more economical way being to reballast the track to a slightly higher level. The result after ten years is that provision has had to be made for raising the contact wire from time to time in order to preserve the necessary clearance.

While in the most recent construction this condition will be provided for by shortening the hangers from time to time, this is generally impossible in the earlier sections of the electrification. In a recent case the procedure was adopted of lengthening the poles. This was effected by first cutting off the tubular poles at the ground line with an acetylene torch, which was necessary because the poles were firmly grouted in holes molded in the foundations, so that they could not be removed without breaking up the concrete with possible damage to the poles. After the cutting off of a pole it was reset in a casting consisting of a baseplate with a cylindrical sleeve, with an inside diameter considerably larger than the pole. A cement grout was tamped between the pole and the sleeve. The baseplate was attached to the concrete foundation with two anchor bolts, which were made long enough to permit the baseplate to be raised 8 in. or more on shims. The extended ends of the anchor bolts were covered with caps of pipe held down by extra nuts.

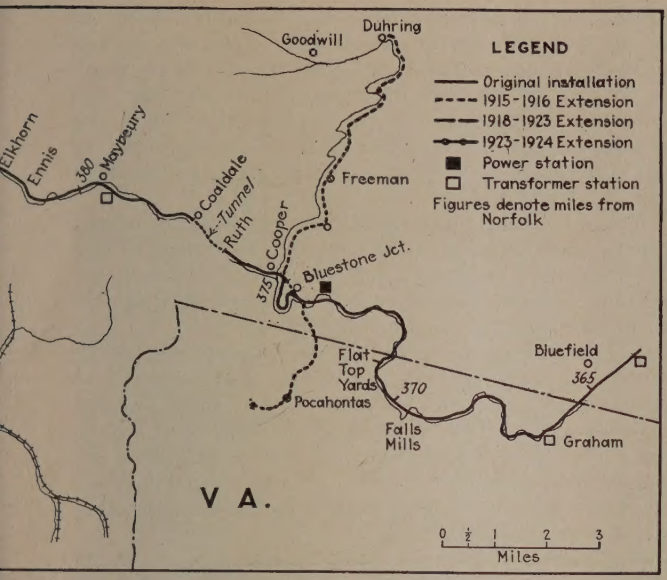
One of the largest reconstruction jobs which has fallen to the electric traction department, and which is now being completed, was due to the relocation of the main line on Ruth Hill between Bluestone Junction and the east portal of the Coaldale tunnel. The original installation at this point was single track, and since it was planned for a double tracking later the extra contact system easily could have been installed. It was decided, however, to relocate a portion of the track at the time the second track was installed, so as to improve the alignment, reducing the maximum curvature from 10 deg. to about 5 deg. This involved the relocation of the catenary structure for a distance of more than 2 miles. New foundations had to be installed, involving cutting off the poles and replacing them in base castings of the type used for raising the overhead. In some cases the cross-structure had to be lengthened. Signal locations had to be changed, and in some places new structural anchor bridges had to be erected.

Line Maintenance Methods

Line maintenance work is done by two groups of linemen, one having headquarters at North Fork, the other at Bluestone Junction. Their principal duties are to repair damage, paint the structures and test insulators. The chief sources of trouble are wrecked pantographs and insulator flashovers. A general line foreman has supervision over all line maintenance, with a foreman in charge of each repair gang. One man has the duty of patrolling the line constantly, for which purpose he rides the trains.

In line maintenance work a gasoline motor car is used, which has sufficient power to pull a trailer carrying materials. Line repair work can be handled from this car also; in fact, it takes care of most of the work, so that the work train is not called out more than once a year.

Work is done on a "hot" line only in the spans. For this purpose ladders impregnated with paraffin are



Indicated on This Map

employed, being in 12-ft. sections. If it is necessary to do work at the insulators the power is shut off. Few accidents happen in line work.

There is little wear on the contact wire, as it is of bronze alloy, and the pantographs are well greased.

Each insulator is tested with a "megger" every year or two. At present not more than 2 per cent of the insulators require to be replaced each year.

Wood strain insulators are used for pull-offs and between tracks. Formerly they gave some trouble from flashovers, but this has been stopped by reinsulation. The original varnish which came on the insulator is scraped off, after which the insulator is heated in a baking oven to dry it out. It then is painted with a dipping varnish and baked. It is revarnished and baked again, after which it is ready for service. About once a year thereafter it is given a coat of air-drying varnish.

There are now six step-down transformer stations for supplying the single-phase trolley. These are located at Bluestone Junction, Graham, Maybuery, North Fork, Kimball and Welch. Each of these is near a passenger station. The station agent gives general supervision to the operation, which is very simple. If a circuit breaker goes out, it rings an alarm bell in the near-by station. The agent steps over to the transformer house, looks at the switchboard to see what has happened, and telephones the power director, who gives him instructions.

All the transformer stations are under the general care of one electrician, with a helper. They visit the substations regularly every day or two.

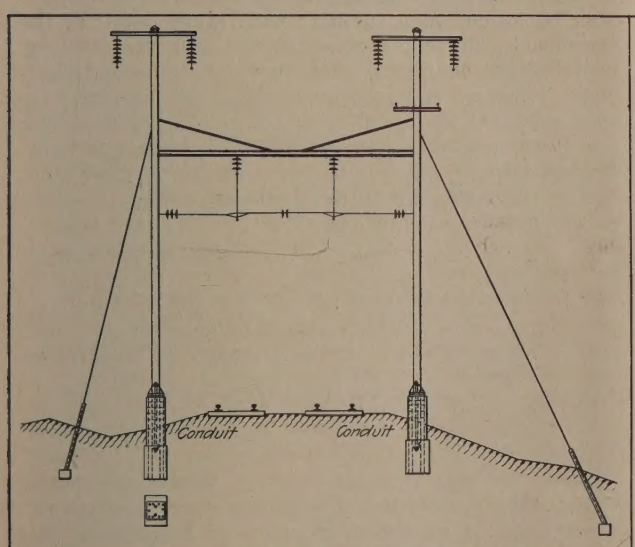
A possible cause of trouble that must be watched carefully is the failure of the supply of cooling water for the transformers. To protect against possible difficulty a simple device is used to warn the station agent by ringing an alarm bell in case of a failure of the supply. A light brass contact lever is pivoted near its middle on a bracket attached to one side of an enlargement of the vertical supply pipe. One arm of the lever passes through a window in the enlarged pipe and reaches into the path of the water current. The other end completes an electric circuit unless it is held out of contact by the force of the water impinging on the opposite end, the arm being pivoted off the center so that it is slightly out of balance.

The transmission line for the extension has been designed for an ultimate voltage of 88,000, although for the present 44,000 volts will be retained. Later it will be stepped up from 44,000 to 88,000 volts at Welch, 20 miles west of the power house.

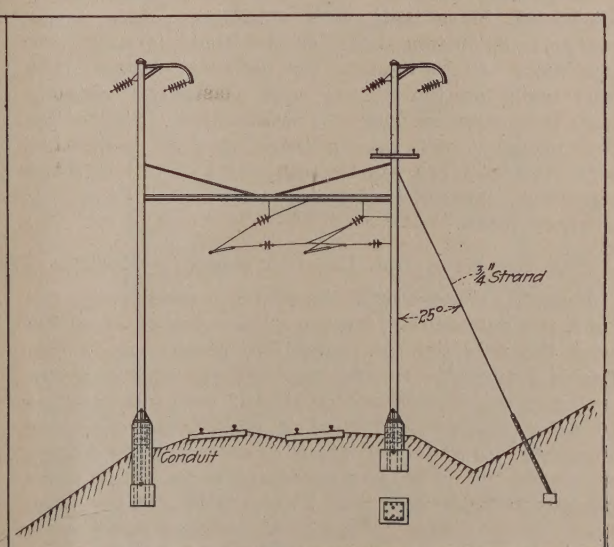
The new line will be insulated with four-section suspension insulators. Several tunnels are included in the route, and the transmission line will be carried over the mountains at the tunnels on a double pole line comprising H-columns set in concrete.

Extension Will Load the Power Plant Fully

Operation of the extension to Iaeger will place a full load on the power plant at Bluestone Junction, where the limiting feature is the supply of condensing water. It also will load to capacity the transmission lines to Welch, which were designed originally with a view to the present extension. The boiler equipment, however,



Essentials of the Farm-Iaeger Section Overhead Construction on Tangent Track Allows for Raising the Contact Line



On the Curves, Which Are Numerous, Special Construction of the Overhead Is Necessary

had to be increased by the addition of two boilers which were provided for when the original twelve boilers were installed. These will be of the Stirling type, similar to those already in operation, with about 6,800 sq.ft. of heating surface each. The total installation will then be fourteen boilers, with a rating of something more than 8,000 boiler horsepower.

A question naturally arising in connection with the power plant capacity is the extent to which the electric locomotives return power during regeneration. Experience has shown that while considerable power is regenerated by trains descending the grades, it is all consumed on the line by other trains, so that while the power plant is relieved of load to that extent, power seldom is returned to the station to be absorbed in the water rheostat provided to guard against such an emergency.

Locomotive Frames Have Been Strengthened

The locomotive underframes originally were not designed for the tremendous stresses imposed on them in the starting of the heavy tonnage trains that are now hauled, in order to secure maximum capacity from the track. The twelve original locomotives not only handled all of the road work, but did the switching as well. The largest overhauling job which has been done has been to rebuild the locomotives with heavier side frames. This was accomplished without interfering with service, although it was carried out during a period of very heavy traffic demands. Today the locomotives are in practically perfect condition.

The lessons learned from experience with the first locomotives have been incorporated in the designs of the four ordered recently. These double-unit engines are now under construction by the Westinghouse and American Locomotive Companies. They will be one-third larger in capacity than the present machines. Their principal duty will probably be in pusher service on the long grade, which has its summit at the Coaldale Tunnel. These machines are due for delivery about Jan. 1, 1924, by which time the extension of the electrified section will be completed. These locomotives were discussed in this paper for Dec. 30, 1922, page 1012.

At present the full load on the 2 per cent grade eastbound, for a train with a leading engine and a pusher is 3,250 tons, while on the lighter grades 1,500 tons more can be hauled. One locomotive holds 3,250 tons easily on the 2½ per cent downgrade eastward from the tunnel by means of regeneration. Two of the new machines will take a train of more than 4,000 tons up the 2 per cent grade, and one will hold the same train by regeneration in the descent of the 2½ per cent grade.

Electric Operation Has Cut Down Congestion

From the standpoint of the men operating the electric zone, the outstanding feature of the electrification has been the reduction of congestion, particularly at the Coaldale tunnel. In the days of the steam engine trains would pile up on each side of the tunnel waiting to get through; now there is never any congestion. Formerly, on the long, steep grade leading eastward up to the tunnel, it was not possible for three Mallet engines to make more than 7 m.p.h. with a full tonnage train of 3,250 tons, whereas the electrics easily make 14 m.p.h. with one leading and one pushing locomotive.

Formerly "turning engines" was a time-consuming process, as it required from ten to twelve hours to recondition a Mallet for service after a run of from ten to twelve hours on the road. Not only was there much to be done in the way of cleaning fires, etc., but engines had to wait their turn for attention. With the electric engines, twenty-four hours or more of continuous service can be secured, while they can be "turned" in forty-five minutes.

Naturally, with these conditions, together with the general improvement in the electric zone due to the small number of clean, easily-controlled and reliable electric engines, the operating men are enthusiastic about electrification as they see it.

The electric crews form an independent section in the operating department, there being at present sixteen to eighteen crews to "protect" the eight or nine locomotives required to handle the traffic at this season. This year the movement of coal is largely westbound, due to the higher prices obtainable in the West. More men are needed when freight movement eastbound (up the grade) is the heavier.

The electric runs are selected by the crews in order of seniority. These runs are preferred to all steam runs except those in passenger service. The latter are in demand on account of the regularity of hours and general working conditions, so that men can depend on being at home at definite times. All freight trains, except time freights, are made up as business warrants, and electric crews are called out in rotation on eight hours notice.

When a run becomes vacant it is posted for five days, and the applicants ranking highest in seniority are assigned to it. The runs of the successful applicants are then posted for five days, and so on.

Men Qualified for Steam or Electric Operation

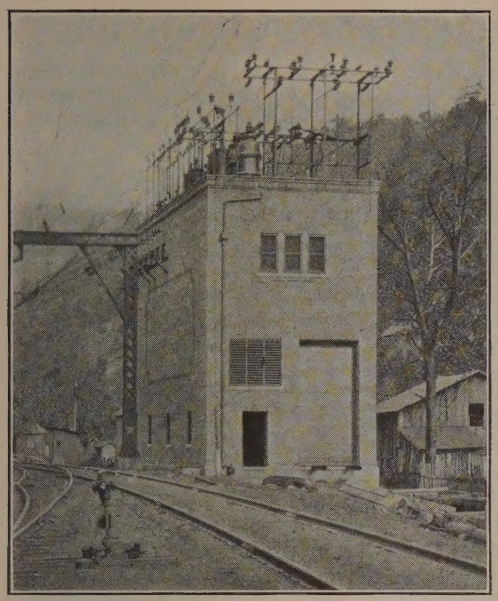
The men placed in charge of electric engines are qualified both for steam and electric operation. A supply of experienced men is assured, since the electric runs are in demand and those who apply for them are high on the seniority list. The steam men soon qualify for the electric runs, about a week being required for an engineer and less for a helper.

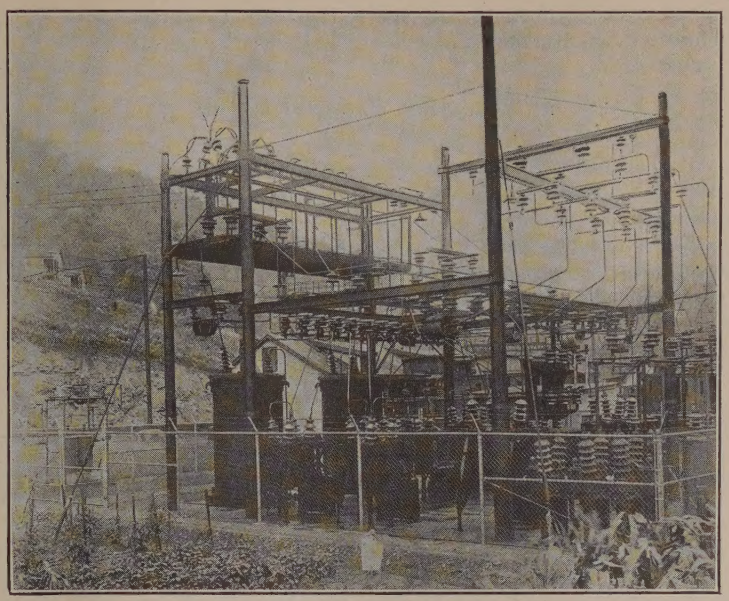
Instruction in electric engine operation is given by an assistant road foreman of engines, who is an electrically trained man familiar with every detail of the equipment. He first explains in the shop the different parts of the equipment and their functions and especially stresses the procedure in case of accident. He then goes into the handling of trains in regular service and gives practice in starting up an engine and shutting it down.

An examination is given at the office, such questions as the following being asked:

In case of wrecked pantographs, how do you protect yourself?
What holds a pantograph up and pulls it down?
How much of the circuit has 11,000 volts on it—that is, the main engine circuit, and what apparatus?
How many different circuits are there on this engine (high tension, low tension and control)?
What are the five duties of the phase converter?
What is the use of the rheostat?
How do you start up a "dead" engine—that is, one with no air?

After the men have satisfactorily passed the examination they are certified for electric operation. In the assignment of runs new engine men are paired with experienced helpers, so that they will not be bothered with details which the helper should be able to handle.





The Earlier Substations Were Largely Inclosed, the New Ones Are of the Outdoor Type

Once each week (Monday morning at present) the instructor holds a meeting of all who desire to attend, at which he reviews the subject of electric operation, answers questions, etc. Steam engine helpers attend this class at their option, if they desire to prepare for electric runs without interference with their regular work. They thus facilitate the taking on of electric runs when they become eligible for them.

In connection with the initiation of new men in the electric service, carefully worked out sets of instructions are used. The following partial quotation shows the general character of these:

Handling single trains with constant-speed electric engine.

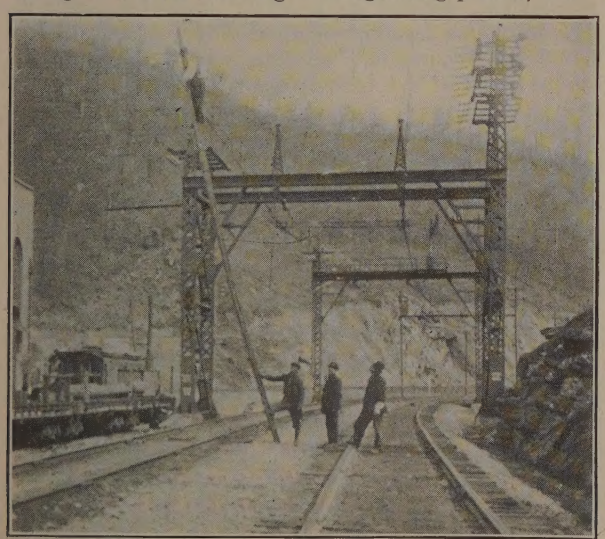
Speed changes. Accelerate first to 14 m.p.h.—change over to 28 m.p.h. by changing two trucks at a time in order to keep slack stretched.

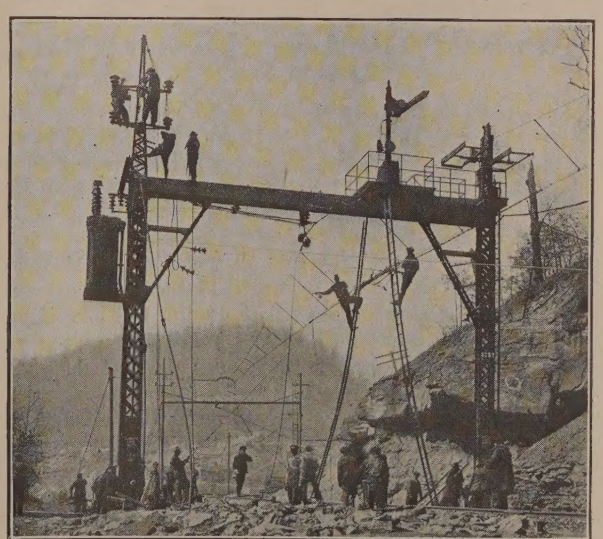
Change from motoring to regenerating. Selecting a time when the train is balanced over the summit in order to maintain constant speed while the change is being made and prevent rough slack action, shut off, throw the balancing lever from motoring to renegerating postion, etc.

An important operating rule, to which special attention is given in the instruction, relates to what is to be done if power fails. Under these conditions the rule provides that the train is to be stopped and hand brakes set. This is done so that there may be no possibility of damage due to air failure.

Power Demand an Important Consideration

Another important thing taught to the new electric operators is the importance of keeping the power plant informed of unexpectedly large demand for power. In order properly to co-ordinate the operation of trains and the supply of power, close communication is maintained between the train crews and the power house switchboard operator. The latter has before him a train sheet made up from reports furnished by telegraph operators along the line. He thus knows at least approximately the probable demand for power. He also has telephone communication with each eastbound signal, so that in case a train is liable to make





The Work Train is Called into Action Occasionally but Most of the Maintenance Work is Done Without It. At the Right is Seen the Operation of Moving a Signal Bridge on the Ruth Hill Job

an unexpected demand for power, the train conductor, engineer or fireman can call in and report the circumstances.

N. & W. Electrification Was Carried Out at a Fortunate Time

In conclusion, a few words regarding the general features of the N. & W. electrification may be of interest.

The electrified zone is part of the Pocahontas division, which covers the Bluefield-Williamson district in Virginia and West Virginia, as well as the Bluefield-Norton through the Clinch Valley in Virginia. The principal function of the electrified section is to gather the loaded coal cars from the sidings and yards along the line, where it is delivered from the mines in the famous Pocahontas coal region, haul them up the long 2 per cent grade and through the Coaldale tunnel, ultimately delivering them at the classification yard in Bluefield. Electric engines also assist in the movement of time freight and passenger trains through the electrified section, but their principal duties are the handling of loaded and empty coal trains.

Certain passenger trains eastbound receive assistance from electric pushers through the electric zone, but they need none when westbound. An incidental advantage of electric operation is that these passenger trains save twenty minutes over their former schedule time for the 11 miles between North Fork and Bluestone Junction. At first it was possible to make up lost time at this point, but the saving is now incorporated in the time-table, which allows thirty-seven minutes for covering this distance. Two steam locomotives and one electric are attached to the train, which makes a free running speed of 28 m.p.h.

The original installation was fully described in the issue of this paper for June 5, 1915, page 45, and in numerous shorter articles. It comprised a 27,000-kw. power station at Bluestone Junction, twelve "split-phase" (single-phase three-phase) electric locomotives, with a rated capacity of 3,000 hp. each on a one-hour rating, and five transformer stations in which the voltage is stepped down from 44,000 to 11,000 for use on the contact wire. Shortly after operation started an additional 9,000-kw. generating unit was installed in the power station.

The Results Have Fully Measured Up to Expectations

The primary purpose of the electrification was increase in track capacity and the result was satisfactory from the start. A dozen electric locomotives replaced thirty-four or more of the then most perfect Mallets. It was found to be possible to handle twenty coal trains eastbound daily, as well as assist six time freight and passenger trains up the grade, the total eastbound tonnage being 65,000 daily. In 1917 the electrical engineer of the railway stated that during the preceding year nine electric locomotives had handled a fifth more freight than forty-three steam engines had done in 1914, the normal number in service being respectively seven and twenty-four. The cost per million tractive-miles was reported to be 12½ per cent less with electricity than with steam.

Fortunately the electrification was in full operation before the breaking out of the war, and it was an important factor in delivering large quantities of coal for use on naval and merchant ships.

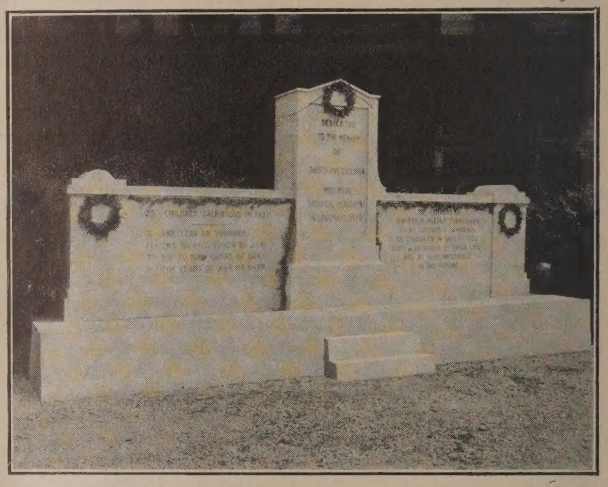
Safety Week in Louisville

The Safety Council Conducted a Successful Campaign—All the Local Industries Were Enlisted and Contributed Freely of Time and Money

By Neil W. Funk
Safety Director, Louisville Railway Company

FOR the past two and a half years our company has had in Louisville a safety council in its own organization that we believe has done and is doing some most useful work in the prevention of suffering, loss of life, and loss of much needed money. Regardless of how well we train our men, and regardless of how careful they are, there are still at least 60 per cent of the accidents that we cannot prevent unless the citizenship in the community is also trained to safety. We therefore welcomed "Safety Week" in Louisville as a fine opportunity to "sell" our citizens the ideals toward which we had been striving so hard and with considerable, yet not complete, success.

The Louisville Safety Council, of which Lee Miles, president of the Louisville Cab & Transfer Company



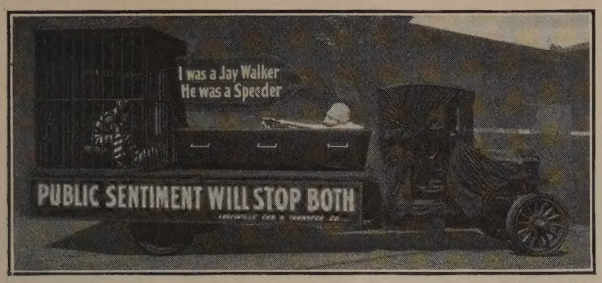
Monument Erected by Employees of Louisville & Nashville Railroad and Dedicated by Twenty-five School Children

is president, decided on a safety week for our city beginning June 3 and concluding June 9, 1923. George H. McClain, managing chairman, was able to interest practically all of our industries, including our railroad companies, in the movement.

The program opened on Sunday, and the ministers agreed to preach from their pulpits on the subject of safety. We therefore truthfully can say that safety week was opened with prayer.

On Monday there was dedicated a monument constructed by employees of the Louisville & Nashville Railroad to the twenty-five little children between the ages of one and fifteen who had been killed by automobiles in Louisville during 1922.

During the week the safety council maintained a bureau to furnish speakers to all industrial plants that requested safety talks. More than 100 large industrial plants had noon-day meetings, and the most prominent speakers of our city considered it a privilege to make safety talks to workmen. In this way the council was able to arouse much public sentiment for the safety movement. The speakers had been instructed to dwell especially on educating the child in safety ideals, and



The Prize-Winning Float in the Safety Parade

plant problems as to accident prevention also were emphasized.

On Friday of safety week perhaps the most beautiful parade that ever passed through the streets of Louisville was organized and held. L. J. Hannah, manager of the Dodge automobile agency, was chairman of the committee in charge. This parade was 2 miles long and consumed about an hour to pass. Numerous floats that represented the various industries of the city testified eloquently as to what the business men thought about the safety movement. Some of the features of the parade were novel. For instance, in the past year ninety-five people had been killed in accidents. This was gravely represented by having ninety-five boys dressed as skeletons to march with measured tread, leading the parade.

A prize offered for the civic organization presenting the finest representation in the parade was won by the Kiwanis Club, which had four impressive floats in line. The prize offered for the business house that had the finest float was won by the Louisville Cab & Transfer Company. The float is shown in an accompanying illustration. There were altogether sixty-five such floats in line. The United States government sent a band from Camp Knox, a regular army training camp. In all, more than 2,000 people took part in this parade. We were convinced that on this day Louisville had been sold on safety and accident prevention work.

Safety week was concluded on Saturday night by a public mass meeting, at which the main speaker was Jeff D. Keen, a railroad conductor of some forty years service. The title of his speech was "The Value of Safety." Our own company's Inspectors' Quartet furnished the music for this meeting.

Just previous to safety week a general meeting of seventy-five business men was held in the offices of the Louisville Railway, where Mr. McClain explained what he wanted the industries of Louisville to do. It was also agreed at this meeting to use as a general slogan the phrase "Don't Get Hurt." During the week this phrase was broadcasted from every truck, street car, and vacant billboard in our city. It also was painted on the sidewalks. This company has twenty electrically-lighted signboards, 8 x 10 ft. in size, which we use constantly to display safety ideals. We put these signs at the safety council's service, and at their request we ran the slogan mentioned above. We also had this "Don't Get Hurt" sign placed in more than 400 street cars, and in the motorman's vestibules. We ran a large truck bearing the slogan through the streets the entire week.

The four local newspapers, the *Post*, the *Courier-Journal*, the *Times* and the *Herald*, all gave their hearty support, and all those connected with the actual work felt that they owed a debt of gratitude to them.

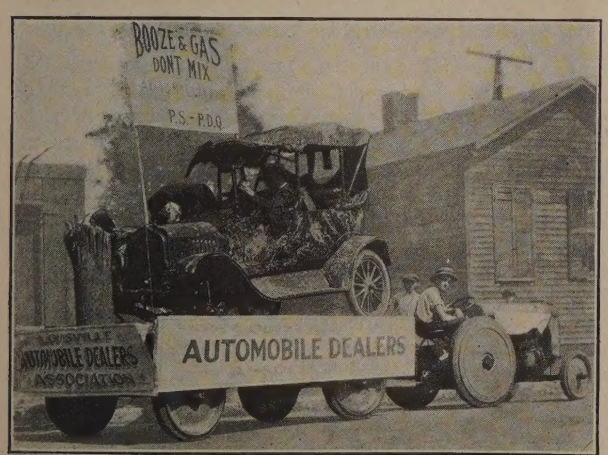
This Slogan Was Displayed in Various Forms All Over the City

Briefly, a word of our own company activities during safety week. We held twenty-two safety meetings, with an average of about fifty men to a meeting. We all felt that small group meetings on a property where a man actually works were more congenial than if we made him dress up and come down town to some hall. The meetings were attended splendidly and the speakers' remarks received attention.

These meetings were addressed by our director of safety and superintendent of transportation. We donated the services of these two men to the safety council during this week. They made sixteen speeches in large industrial plants and on steam railroad properties.

C. W. Price, vice-president of the Elliott Service Company, was with us the entire week. He was the director general of the whole affair. It will be a long time before Louisville forgets the personality and splendid energy of this man.

We think we obtained great results from safety week. There was not a single fatality and but one serious accident, while there were three accidental deaths and twelve serious injuries the preceding week. Since then we have had very few serious accidents in the city. As far as results in our own organization are concerned, we believe it accomplished much. The Sunday following safety week we ran from 300 to 500 cars for twenty-four hours through our streets without a single accident, something we had not done in recent years. We, in Louisville, have also discovered and believe that with co-operative activity and enthusiasm from our business men and industrial organizations, safety ideals can be sold to the citizenship of a community as easily as merchandise.



The Wrecked Ford Attracted a Great Deal of Attention

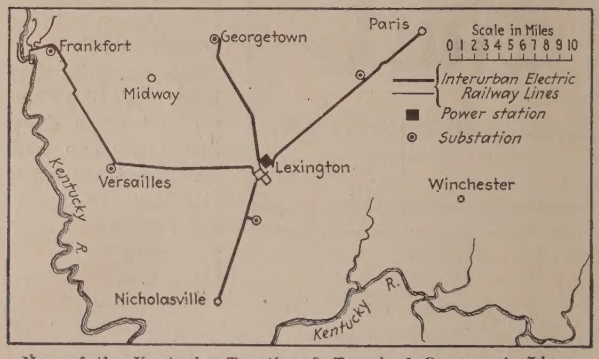
And Now, One-Man Freight Cars

Kentucky Traction & Terminal Company Applies Same Principles in Package Freight Service as Have Proved Successful in Passenger Business

FOLLOWING the substitution, early last year, of light interurban passenger cars for others three times as heavy, the Kentucky Traction & Terminal Company has put two light freight cars in service, with one-man operation. These cars weigh 31,000 lb. each, are 40 ft. in length and are equipped with four 25-hp. motors, like the passenger cars. They were built by the Cincinnati Car Company. The management feels that their operation has been highly successful.

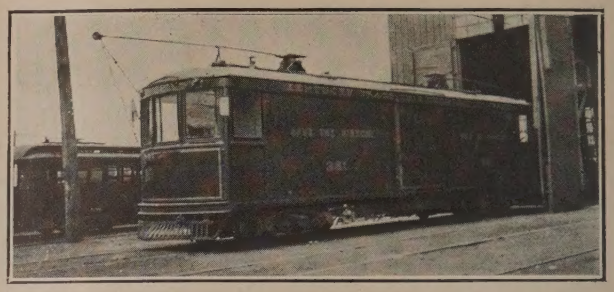
The general design of the cars is shown in the accompanying plan and elevation, together with the important dimensions. Each car is equipped for double-end operation, a compartment for the motorman being partitioned off at either end. An electric cab heater in each compartment is provided. The center end windows and the motorman's windows are equipped with drop sash, the wing sash being stationary.

As shown in the accompanying map, four interurban lines radiate from Lexington to Frankfort (the state capital) and Versailles, Georgetown, Paris and Nicholasville. In each city there is a combined passenger and freight terminal. In each is an agent, paid by the month, who is normally on duty from 7 a.m. to 6 p.m., except at Lexington where he comes on at 6 a.m.

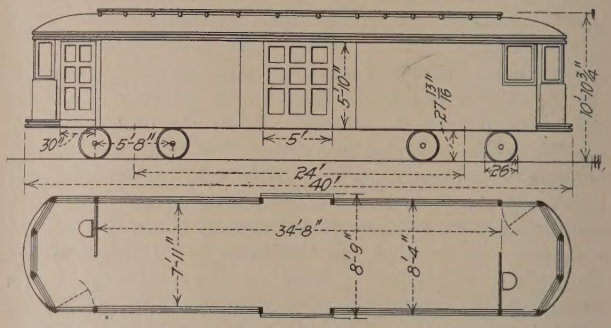


Map of the Kentucky Traction & Terminal Company's Lines

This Covered Inclined Freight Platform Is in the Rear of the Station at Georgetown



The New Package-Freight Car Weighs but 31,000 Lb.



Plan and Elevation of the Light-Weight Package-Freight Car

Accompanying illustrations show the rear of a building, on a prominent street in Georgetown, which is being remodeled for use as a passenger and freight station. Here the track swings off the street onto a trestle at one side of the property, where an inclined platform leads from the car floor level to the freight shed.

The schedule of operation for a day is this: Two cars leave Lexington early in the morning, respectively for Versailles and Frankfort (28 miles) and Paris (18 miles). After delivering their loads they take on freight for Lexington, and, returning, they load up at Lexington, one for Georgetown (12 miles), the other for Nicholasville (12 miles) and again return to Lexington. Each car thus makes either 60 or 80 miles in one day.

The freight cars are operated by one man unless way deliveries must be made, in which case another man is added. The company does not deliver freight locally, but in Frankfort has a delivery contract with a local truckman.

London Tramway and Bus Accident Showing Is Creditable

H. E. BLAIN, assistant managing director of the London Underground group, recently was the principal speaker at a meeting of the London Safety First Council, on which occasion he gave statistics regarding the street accident situation in London. He said that in the metropolitan area 104 more people were killed in 1922 than in 1921, the total number of killed being 684 and the number of injured 26,322. Of the total accidents 6 per cent were caused by motor omnibuses and 7 per cent by tramcars, the percentages being the same for 1922 as for 1921. As there was more than 6 per cent increase in passengers carried by omnibuses and nearly 3 per cent in those carried by the tramways, this showing was considered creditable.

For 1922 trade motor vehicles caused 21 per cent of the total accidents, motor and pedal cycles caused 21 per cent and private motor cars caused 24 per cent, a total of 66 per cent, or two-thirds, for these causes.

Electric Railway Construction and Operation in Cuba—II

An Absorbing Account of the Means Followed in Adjusting Electric Car Equipment to Unusual Conditions—The Results Obtained Justified the Electrification

By L. Geenens
Chief Electrical Engineer Hershey-Cuban Railway

IN THE July 28 issue of this paper the author described why the Hershey-Cuban Railway was built by the Hershey Chocolate Corporation, the power generation and transmission system used and how the special electrical conditions brought about by the tropical climate were met. In this concluding instalment an account will be given of the rolling stock used, the shops in which the cars and locomotives are maintained and some facts about transportation conditions on the line.

The Cut Sugar Cane Is Hauled to the Nearest Electric Railway Loading Station in Ox Carts

The line started electrical operation with fifteen motor cars, of which ten are straight passenger, three combination passenger and baggage, and two straight baggage. There is one tower car for line work. The specifications for the passenger and tower cars follow:

PASSENGER CARS

Manufacturer	J. G. Brill Co.
Seating capacity	50
Speed	40 m.p.h.
Weight	28,000 lb.
Length	49 ft. 3 in.
Width	8 ft. 6 in.
Trucks, type	Brill 27 X-MCB
Wheel base	6 ft. 3 in.
Wheels, diameter	33 in.
Distance, centers of trucks	26 ft. 4 in.
Control	PC-101 multiple control
Motors	Four—GE-263 (65 hp.)
Gear ratio	64/22
Headlight	Incandescent, 32 volts
Current collector	Pantograph
Air compressor	CP-29
Lightning arresters	Aluminum cell.
Length of seats	38 in.
Width of aisle	23¼ in.

TOWER CAR

Manufacturer	J. G. Brill Co.
Length	40 ft.
Motors	Four—GE 263 (65 hp.)
Control	GE—K-47
Gear ratio	71/15
Headlight	Luminous arc, 600 volt

Each car has its own pantograph and carries in addition a trolley pole at each end for use on direct suspension overhead should it be needed to run the cars over tracks so equipped.

No power bus was provided for train operation. Only a 9-conductor 32-volt control cable runs through the train, together with the air-brake lines. It was soon felt that the existence of a power bus would have a marked advantage. Single car train are seldom run on the main-line service, there being always from two to seven or eight cars in a train. This means that with all pantographs up, the wear of contact strips and trolley wires is three times what it would be with one pantograph up for every three cars. Any obstructions in the way of the first pantograph will wreck not only this pantograph but usually all the pantographs of the train and thus cripple the train entirely. With only half or two-thirds of the pantographs up, there would be enough spares to continue the trip, and through the power bus the train would have full power in all the cars the same as before. If any pantograph of a train develops a defect during the trip, it can be lowered and another one raised without changing the driving power of the trains.

As 1,200-volt jumper cables are not desirable, a system was developed using the trolley poles already installed on the cars. The method is shown on page 213 and consists in the use of a ⅝-in. steel rod carried on a "boom" at each end of each car and extending out far enough to rest on the trolley wheel of the next car. Proper electrical connections are made on the roofs of the cars. This forms a connection of large capacity as it consists of two trolley wheels and poles in parallel.

One of the Electric Locomotives Leaving a Loading Station with Ten Cars Loaded with Sugar Cane

It is very flexible as the wheels rolling on the rods take up all the motion between cars. If the cars are uncoupled the parts will clear each other automatically. All high-voltage parts are out of reach of the public and are entirely safe for the train crews as they handle only the trolley ropes. The device takes the curves without any trouble and has been working to our entire satisfaction.

The cars in general have been giving good service and are well adapted to the requirements of the line. The only field for improvement in the design is the ventilation. In a tropical climate an effort to provide all ventilation by means of louvers or hinged sash in the monitor roofs is not a success. Aside from their high maintenance, due to the warping of the frames from dampness, they have to be closed at each rain. These rains occur with a suddenness and force unknown in Northern climates and it is usually impossible for the train crews to close so many hinged monitor sashes before the passengers are drenched. With all doors and windows closed and a normal temperature of from 85 to 95 deg. F. the condition inside the cars soon becomes unbearable. Powerful roof ventilators, thoroughly rainproof, would be a decided improvement.

During the winter months there are cold winds and heavy mists, which make the passengers close the windows, and the situation encountered during the rainy season is repeated. With the side windows closed it is too hot and with these windows open and the car running at high speed there is a violent draft all through it. A possible solution would be to make the lower car sash stationary and the top part slide up.

Locomotives and Machine Shop

There are seven electric locomotives of 60 tons each, with the following characteristics:

Manufacturer	General Electric Company
Weight	60 tons
Motors	Four—251A
Control	Multiple unit
Compressors	Two—CP-30 of 35 cu. ft. each
Control power	600-volt dynamotor

The shop where the rolling stock of the railroad is maintained is in Central Hershey, alongside a well-equipped machine shop of 225 ft. x 38 ft. The latter shop is not a part of the car shop in that it has an independent force and carries out all the machine work needed for the car shop, sugar mill, power plant, agricultural department, etc. The car repair department sends its work to this shop through a system of work orders in the same way as other departments do. Hardly 40 per cent of the machine shop work comes from the car department, most of the remainder being repairs for the two sugar mills of the company. All machine tools in this shop are electrically driven with individual 440-volt three-phase induction motors. Two air compressors supply air for the car shop, machine shop, sugar mill and power house, a plan which eliminates the need of separate compressors for each of these departments.

A small foundry is operated in connection with the machine shop. Iron, brass and aluminum castings are made to replace broken parts, and enough new work is added to operate the foundry efficiently. When it is considered that it will take from one to two months to secure material on a rush order from the United States, it will be realized that a small foundry of this kind proves very handy for emergency repairs. It goes hand in hand with the acetylene and electric welding. A welder trained locally and handling both apparatus is working steadily, and at times a second operator is added.

The machine shop also takes care of the welding of broken rail bonds. For such repairs, the acetylene welding outfit is loaded on a gasoline-driven track automobile, and cylinders of compressed acetylene gas and oxygen are used. In the shop and around the mill and plant an acetylene generator, permanently mounted on a small track car, is used. A general repair of the bonding is made every year some time before the crop is gathered and ahead of the heaviest traffic.

There is no wheel lathe in the machine shop, as this work is easily handled on the heavy-duty 6-ft. lathe used for grooving the mill rollers. This lathe lies idle during the grinding season and by proper organization of the work, all wheel turning can be done during this period. This lathe is located in the mill room of the sugar mill, where a 20-ton crane is available for handling the work. When needed later, a wheel lathe will be installed.

The machine shop force also maintains and repairs the steam locomotives used on the cane supply tracks which are not electrified.

Car Shops and Shop Organization

The car shop itself is in a steel building 200 ft. long by 85 ft. wide, adjoining the machine shop already mentioned. It contains thirteen tracks, one drop pit

for steam locomotives and four inspection pits. The car shop force maintains the rolling stock consisting of: fifteen passenger motor cars; seven 60-ton electric locomotives; 170 sugar cane cars; sixty box cars; twenty-five gondola cars; thirty-one flat cars; six cabooses; one locomotive crane; one wrecking crane; miscellaneous work-cars.

A superintendent of equipment is in charge of all operations in this shop and reports to the electrical engineer. His force is divided in three groups, as follows: the electrical group, the mechanical group and the car inspectors and cleaners.

The electrical group, composed of three electrical mechanics, maintains everything electrical on coaches and locomotives.

The mechanical group is composed of one foreman and from nine to twelve men, according to the work. Each man has a specialty. There are carpenters, riveters, boiler makers, air brake men, painters, etc. These men do everything which is not electrical, from renewing the rattan of seats in the coaches to changing bolsters, painting cars, picking up wrecks, etc. The rule is that each man must turn in a day's work, no matter what his trade is. It is not strange to see a carpenter handle a cold chisel or a painter drive rivets. The men are given every opportunity to learn. They are rated according to what they are able to do and not according to trades. The men like this system and the best results are obtained.

The third group is composed of train inspectors and car cleaners. There is a day and a night inspector at each terminal. All these men have passed through the shop and have practical knowledge of repair work both on freight cars and coaches. They take care of the interchange of freight cars with neighboring lines. These men have a fair knowledge of the electrical devices such as the renewal of contact strips on pantographs, replacement of fuses, etc. They are not relied upon, however, to maintain the coaches or locomotives, their work being more in the nature of a mechanical inspection, such as is done on passenger coaches on steam lines.

After a car has been on the road for fifteen days, covering some 3,600 miles, it is brought into the shop for one day and thoroughly examined. A competent man looks for worn or broken parts, loose bolts, clearances on side bearings, brake adjustment, leaky air pipes, etc. The electrical men examine the motors, commutators, brushes, control, lightning arresters, etc. The car is washed and disinfected; pantographs are tested for pressure against contact wire; brakeshoes renewed, etc. After this, the car is ready for another run.

Once a week, to supplement the inspections at the terminals, one of the three electrical mechanics from the shop is sent to these terminals to oil the journal boxes and renew motor brushes if needed. These are the only men authorized to oil journals, renew brushes and in general do work on the control devices of the cars and locomotives.

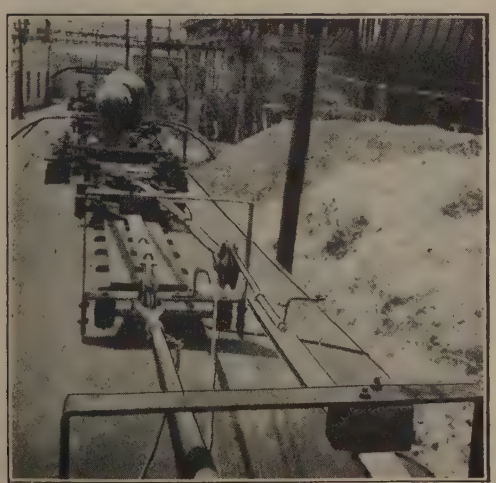
The electric locomotives cover some 2,000 miles before being inspected. The only work done during these runs is to change the brakeshoes, oil the bearings and adjust the brushes.

There is no night shift of any kind. The practice on steam operation of having hostlers and mechanics prepare the engines and attend to the departure of the locomotives has been entirely eliminated. The engineers take their cars and locomotives themselves. They have the keys of the doors. They raise the pantographs, fill the air-brake tanks and go off. A locomotive left in perfect working order by the shop force should remain in that condition for any length of time and therefore need no further attention when leaving.

A blackboard in the shop shows at all times the locomotives and cars ready for service. Special efforts are made to have as much of the equipment as possible in working order at the end of each day. All equipment which cannot be ready by night is reported to the traffic department with an estimate of the time during which the equipment will be out.

A general overhauling of each locomotive is done every two years during the non-grinding season when fewer locomotives are needed. They are taken out of service for one week. Unnecessary dismantling is avoided, parts which don't wear are not taken apart. The electrical control and the air-brake parts are left in place as all of these can be cleaned, inspected and tested while on the locomotives. The attention is concentrated on the driving motors and journals. Motors are removed, armatures and field coils are cleaned, painted and baked. Control coils are dipped.

It was found that at least twice a year all iron parts of the control of both locomotives and cars should be scraped and painted as a protection against rusting. Galvanizing does not last. There would be



At Right—A Three-Car Main-Line Train Operated from One Pantograph. The View at the Left Shows the Power Connection Between the Cars

a marked reduction in maintenance in the tropics if brass, aluminum or copper were used in place of iron in the control parts. This refers not only to controls for cars or locomotives but also for automatic substations. All magnet coils should be so thoroughly dipped or coated with weatherproof compounds that not the slightest moisture can penetrate. Resistance

Passengers Leaving the Boat Landing at Casa Blanca to Board the Matanzas Train

tubes for instruments or other purposes with the resistance wires exposed do not last over two years.

When a passenger car is brought in for equipment overhaul the trucks are changed, and the car goes back in service after one day.

On both the cars and locomotives the oil in the air compressors is renewed every 20,000 miles. The crankcase is washed with gasoline and new oil introduced. This system has been most effective in keeping the bearings in perfect order. The locomotives have made more than 60,000 miles, and no shims have been removed as yet from the crank bearings of the compressors.

The locomotives, cars and automatic substations are still operating on the first set of contact tips on all the contactors after two years of service.

In an effort to counteract the rapid rusting of the steel cars used for hauling cane, the cars were sand blasted and afterwards sprayed with a blast of hot Mexican crude fuel oil atomized and heated with steam. This material has adhered to the surfaces better than any paint. Under the tropical sun it dries thoroughly within a couple of months. It is easily lettered with white paint. After one year of service, this coat was as good as new. The cost of material and labor was $1.35 per car.

TRAFFIC AND TRANSPORTATION

When the electric service on the line was begun the steam locomotive engineers who knew the road were broken in as operators of electric locomotives. They required the practice of only a few days with an instructor. It is remarkable how easily this change from steam to electric was made. Some engineers will still occasionally heat up the resistance grids by running on intermediate steps of the controller. In steam operation, every stop of the throttle is a running position, and they will forget this difference. They were eager to be assigned to electrical equipment. Most of the steam equipment was old, and it needed considerable attention and repairs on the road to keep it going. This meant longer hours, much dirt, heat, and in general, harder work without seeing results.

Steam engineers make the best operators for electric locomotives. They are fundamentally mechanics, used to harder conditions than are generally encountered in electric service, and they know how to handle trains on the road, which is far more important than to know the details of their locomotive. We take it for granted that in most cases they cannot make repairs of the electrical equipment on the road. We don't expect them to, and in case of failure spare equipment is immediately substituted. We consider that the electrical equipment must be so perfected and foolproof and so well maintained that these failures on the road are very exceptional. The methods of maintenance are established from the experience obtained from these failures. This procedure eliminates a considerable amount of teaching to new motormen while it throws more responsibility on the shop force.

There are six passenger trains each way daily. These trains make the trip from Casa Blanca, across the bay from Havana, to Matanzas, 56 miles, in two hours and fifteen minutes, with six official stops and twenty-five flag stations. They run at an average schedule speed of 25 m.p.h. These trains are composed of from two to four cars and occasionally six and eight to handle excursions.

At Casa Blanca the trains stop in front of the ferry landing of the Havana Central Railroad and the schedules are so arranged that the passengers to and from Havana make connection at this point. Arrangements between the two companies permit tickets to be sold and baggage checked at the Havana landing for any destination along the line. Passengers for Havana are provided with tickets in two parts, one of which is kept by the conductor on the train and the other is collected at the ferry. The railroad company transfers the baggage between train and ferry.

Excursion trips are organized during the winter season between Havana and Central Hershey for tourists wishing to visit the sugar mill in operation. The trip includes the transportation, a conducted visit of the mill, lunch at the Hershey Hotel operated by the company, and an automobile trip through the surrounding

Freight Station at Casa Blanca with an Express Car on One Side and a Freight Car on the Other. Merchandise Is Received at the Front of the Station

country, particularly the tropical gardens around the water pumping station which are being developed into an amusement park.

Central Hershey has become a favorite excursion place for clubs and schools from Havana and Matanzas. There are baseball grounds, race tracks, tennis court, dancing hall. Saddle horses can be hired for trips through the surrounding hills. Although no special efforts have been made to develop these amusements, it quite often occurs that all the cars are required to handle these crowds. The average number of passengers carried per month is 37,000, and the average

length of ride per passenger is 16 miles (27 km.). The freight movement over the line consists principally of the transportation of sugar cane from the loading stations to the sugar mill. From 1,800 to 2,000 tons of cane are brought from the fields daily in specially constructed railroad cars made to handle this bulky material. The 60-ton locomotives are able normally to haul eight loaded cane cars over the heaviest grade of an average of 2.5 per cent extending for 4 km. From four to five cane trains are run daily, and their schedule is arranged to suit the most efficient load condition at the power plant. Branch lines used exclusively for hauling cane during the six months of grinding season are not electrified because the economy to be derived from electrical operation on these lines does not justify the investment in overhead lines and power plant capacity. The cost of material and labor for electrifying, according to the standard type of construction on this road, and including a feeder, is $5,000 per kilometer, or $8,000 per mile. This figure does not include power plant and substation equipment nor transmission lines. Two steam locomotives are used for these branches. They distribute the empty cars and bring the loaded cars up to the main line from where they are handled with electric locomotives. These branches are merely industrial sidings as they are not open for public service.

A through train of coal cars leaves the Havana terminal daily and is delivered at Matanzas for shipment towards the interior of the Island. There is also a miscellaneous freight train running from each terminal daily. The railroad operates its own express service, which is practically the only means by which small packages can be delivered in the country.

The whole line was never operated by steam with the traffic as now existing, and therefore there are no definite comparative figures on fuel consumption, payroll, etc. However, some comparisons are interesting. The sugar crops of 1919 and 1920 were gathered with steam locomotives, and the fuel oil consumption during those crops was nearly the same as is now being used in the power plant, which supplies not only the power for moving the crop but also the power for two to four freight trains and twelve passenger trains daily and more than 400,000 kw.-hr. per month of outside load. This is not surprising in view of the utter inefficiency of oil-fired locomotives in the hands of native firemen entirely ignorant of the most elementary laws of combustion. Then, also, it should be considered that a passenger coach which takes 80 kw.-hr. to go from one end of the line to the other, thus using 15 gal. of oil, is consuming only as much oil as would be needed on a steam locomotive waiting in a siding for half an hour or so. Altogether, counting the oil used for fuel in five or six steam locomotives during the time that they are not moving, we can easily conceive that this oil, added to the oil wasted on these locomotives through bad combustion, will be sufficient to move the additional tonnage and produce the extra power mentioned before.

An immediate result of the electrification was the elimination of the pumping stations required by the steam locomotives. Ten such stations existed, of which six had elevated tanks and permanent operators, while the others were steam pumps run from the steam locomotives themselves. Stations with operators cost more than $1,000 a year. During the dry season considerable trouble was experienced due to lack of water, while some of the waters were corrosive. There are now only three emergency stations consisting of hose connections from city water mains, one at each terminal and one at Central Hershey.

Department Heads in Boston Inspect Property

THERE was an innovation in the practice of the Boston Elevated Railway on July 27 when the department heads took a tour around the property together to visit points of particular interest at the present time. A day was taken for the trip which was made in one of the company's buses. The first point visited was the South Boston power station, where foundations are being laid for a new 35,000-kw. turbine, condensing water tunnel, etc. A stop was also made at the division headquarters on Park Street, where the company has recently installed a passenger waiting station and a handball court for the employees. The next stop was at the Cedar Grove station of the Shawmut Branch Railroad, whose operation is to be taken over by the Boston Elevated Railway. Other stops were at the Lake Street car yard, the new Allston garage, the Bennett Street car yard and carhouse at Cambridge, the Harvard Square station of the Cambridge rapid transit line, the foundations for the new repair shop at Everett, the new Salem Street division headquarters in Medford and elsewhere.

A group view of the party, taken in the yards of the South Boston Station is presented. Left to right they are H. M. Steward, superintendent of maintenance; Edward Mahler, purchasing agent; H. W. Blake, ELECTRIC RAILWAY JOURNAL; C. W. Mulcahy, assistant general counsel; John Lindall, superintendent rolling stock and shops; James Smith, superintendent of transportation; Edward Dana, general manager; C. W. Learned, superintendent of inspection; H. W. Putney, secretary of the transportation department; H. B. Potter, assistant general manager, and F. S. Freeman, superintendent of power.

Boston Elevated Railway Officials Visit South Boston Power Station While on Tour of Property in Bus

The opportunity afforded to the heads of the departments of discussing on the ground the effect of new developments under way or contemplated proved so satisfactory that similar trips will probably be taken in future, perhaps periodically.

Utilizing an Unusual Carhouse Site in East Providence

The United Electric Railways Is Constructing a Large Carhouse with Excellent Facilities for Inspection and Maintenance

THE United Electric Railways, Providence, R. I., is spending several millions of dollars in improvements this year. Among the structures under construction is a carhouse with capacity for ninety-eight 40-ft. cars, located in East Providence. This is of special interest because the directors of the company insisted that it be constructed at the absolute minimum of expense. Hence, among other items, the square tower at the corner, a feature of most of the company's carhouses, was omitted and every detail was studied with a view to elimination of any unnecessary cost.

The building is more than 460 ft. long over all and nearly 170 ft. wide at the front. It contains two six-track bays separated by a fire wall and a two-story row of offices, shops, etc., on one side as indicated in the plan and sections reproduced.

The doors inclosing the portion of the structure used for inspection are about 100 ft. inside the front end, decreasing the amount of building to be heated but providing shelter for two dozen cars. This part of the building has a 4-in. tar concrete floor, but no pits.

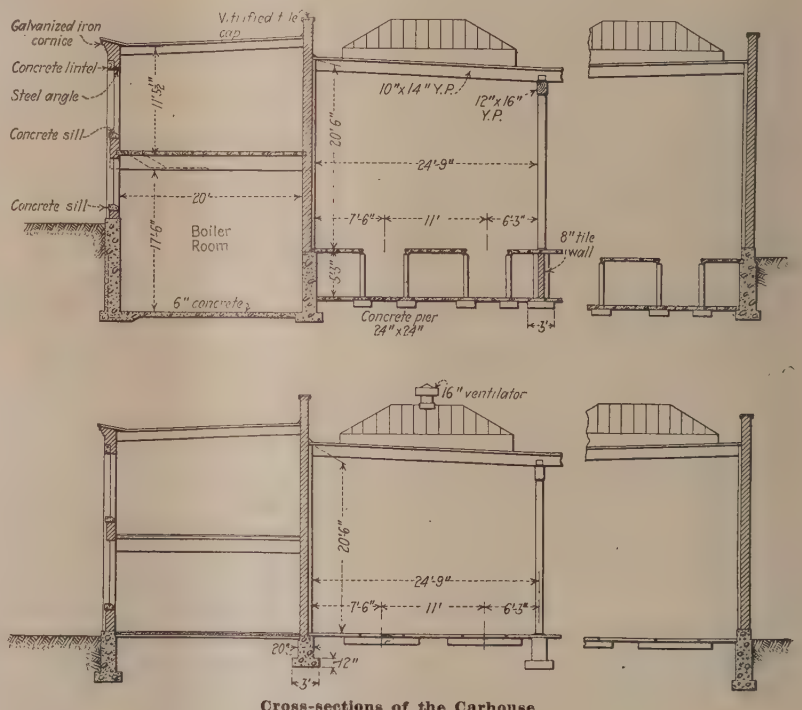
Behind this open section in the second bay is a 180-ft. pit section, for general inspection work only, and behind this is another large tar-concrete floor section for car storage. These sections are separated from the front open section by doors hung from roof-supporting columns.

Behind the open sections of the bays all tracks are provided with pits. Here are facilities for changing wheels and armatures, etc. Pit hoists are provided in two pits, a wheel grinder in another, and a large general repair shop, centrally located, is equipped to handle all ordinary maintenance work.

In conformity with the economy program, slow-burning mill construction was selected. The roof is of 3-in. yellow pine planking covered with tar and gravel. This is carried on heavy timbers supported on 10-in. x 10-in. yellow-pine columns spaced 20 ft. apart along the length of the building and 24 ft., more or less, across it. A liberal installation of metal skylights in the roof insures an ample supply of daylight, and a sufficient number of ventilators have been installed to provide fresh air.

For fire protection a sprinkler system is the main dependence. It is supplied from a reservoir located under the floor of the repair shop.

In the pit sections the track rails are mounted on 4½ in. round cast-iron columns, with ½-in. shell. The base of the column is a 12-in. flat plate with brackets cast on the four diagonals. At the upper end the column terminates in a flat plate 10 in. long and about 6 in. wide. In order to insure uniformity in the height of the columns and squareness at the tops, the tops are given a light cut in the machine shop.



Cross-sections of the Carhouse
Above, through pits; below, through open section

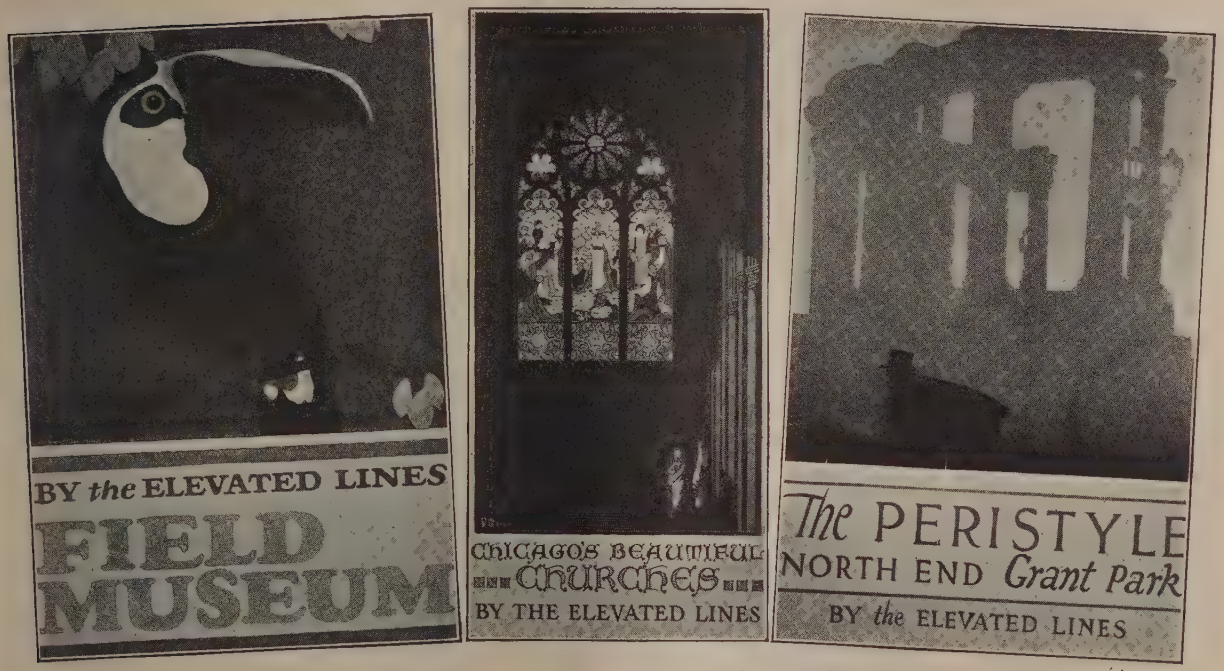
General Plan of East Providence Carhouse

The base plates rest on concrete piers 24 in. x 24 in. in size and they are embedded in the concrete floor of the pits. On the upper plates rests the 8-in., 79-lb. rail, to which they are bolted with four heavy cap bolts for each column. The rails, in turn, support a reinforced concrete floor in the manner shown in a detail reproduced. The rail level is 4 ft. 9 in. to 5 ft. 3 in. above the pit floor.

This form of construction is so rigid that no side bracing is necessary. It provides an open area in the pits facilitating cleaning and rendering all of the basement space accessible.

Merchandising Transportation on the Chicago Elevated Railroads

Posters, Newspaper Advertising and Motion Picture Films Present Advantages of "L" Transportation as Well as Increase Friendly Feeling and Better Public Relationship



Done in Beautiful Colors, These Posters Advertise the Chicago "L"

ACTING on the theory that modern merchandising methods are as applicable in selling transportation as they are in selling dry goods or groceries, Britton I. Budd, president Chicago Elevated Railroads, some time ago created a commercial department having this function. Such a step was taken when it became imperative to increase riding on these lines, following a cut in fares which went deeper than a companion cut in wages. The only means in view of caring for the apparent deficit was by increased riding.

Every method known in modern advertising was immediately begun by John J. Moran, head of the department, following his appointment. The "weekly pass," new to the Chicago public, which was also instituted as a fosterer of increased riding, was made the chief "selling" argument. "L" patrons had to be educated in its uses. A campaign of newspaper advertising in the big local dailies, as well as foreign language papers, was the first step in Mr. Moran's work. Announcements of the new form and rates of fare were made with ideas and suggestions for the use of the pass as adjuncts. This was complemented by handbills, car and station cards and posters in the windows of the cars. A direct-by-mail campaign was also begun. When a man moves into a territory served by the Elevated he is greeted by a friendly letter welcoming him to the community and setting forth the excellence of the elevated service. This campaign has been found very valuable and is being continued on a large scale.

Probably the most valuable form of advertising ever developed by a transportation system, and the cheapest, is an outgrowth of the weekly pass, known as "co-operative advertising." It is plain to the regular patron on the Elevated that he may obtain additional rides for a slight cost in addition to what he formerly had to pay for his travels to and from work. To cultivate this off-peak traffic was the initial work of the commercial department and the work upon which its efforts were centralized. It was found comparatively easy to prove to the owners of the large motion picture houses, dance halls, theaters and other places of amusement in Chicago that the holder of an unlimited ride "L" pass would be a profitable person to appeal to in their advertising, because he would have to pay nothing

extra for transportation to reach their establishments.

In advertising to reach customers for the weekly pass space was utilized in stations and on trains which had formerly gone to waste as far as advertising purposes were concerned, and Mr. Moran was able to enter into co-operative arrangements for this advertising with most of the larger and more desirable places of amusement, known to be most progressive in their advertising. Some of the examples of this method of advertising and the value of the results follow:

Co-operative Advertising with Theaters, Museums and Circuses

It had been the custom of the Elevated roads for the past eight or nine years to carry a painted wooden sign on the "head end" of each train announcing ball games at the two big league parks in the city. During the winter, necessarily, these signs were not used. The owners of the largest string of motion picture theaters in Chicago asked for this space, giving in return a 50-ft. motion "trailer" on the end of their feature picture, a concession for which they had repeatedly turned down large monetary offers. The "trailer" film read simply "It costs you nothing extra for transportation to visit this theater if you use your unlimited-ride weekly 'L' pass." This message reached more than 500,000 persons weekly through this medium.

Another motion picture combine granted Mr. Moran the same privilege for this "trailer" in return for window posters in cars and stations. This firm operates a chain of sixteen motion picture theaters in Chicago. In both instances the cost to the Elevated was merely that of the trailer, a small sum, the picture houses bearing the cost of printing and painting the signs. When it is realized that this movie concern rejected an offer of $10,000 for a week's showing of a similar "trailer," the significance of this advertising may be readily appreciated.

The field of operation in co-operative advertising was found to be very broad. The Field Museum, the Art Institute, the Chicago Historical Society and other civic centers of education and culture, as well as some of the churches, were quick to realize the importance and value of such advertising, and their response to suggestions by Mr. Moran has been marked.

When the circus came to town a large banner bearing the legend "Two World Leaders: Chicago Elevated Weekly 'L' Pass and Sells-Floto Circus" was exhibited in return for station cards advertising the show. Several dance halls have offered passes for prizes in their competitive contests. Many motion picture theaters have admitted the holder of an "L" pass free during a stated period. The value of this concession to the Elevated management as a good-will builder cannot be overestimated.

A survey of the elevated stations has been made by the commercial department and vantage points for the station cards chosen. Every turn a patron makes, from the time he enters the station until he reaches the train platform, he is greeted by a card or poster. Metal frames have been installed in which the cards fit snugly, insuring neatness, ease of placement and uniformity.

The Posters Are Artistic

Art was formerly far without the scope of an electric railway. It is surprising, therefore, to note the ease with which the Chicago Elevated has adopted it in its advertising. Mr. Budd, acting on the lead of the London Underground, inaugurated a series of beautiful posters pointing out to Chicagoans the attractive spots of their city. Under the management of Mr. Moran, who took this work over as part of the commercial department, the splendid standards set by Mr. Budd have been maintained. The posters, some of which are presented herewith, carry a minimum of wording which does not interfere with the artistic designs.

These Posters Advertise Special Attractions as Well as the Value of an "L" Pass

Because of their individuality and newness in the field, many requests have been made by the public for samples of the posters. Schools, artists' exhibits and meetings and private individuals all over the country have made use of them for various purposes. The value of such posters in schools, where many were used as models in art classes, is apparent. The minds of the children, being in their formative period, quickly grasp the idea and lasting impressions are made.

Many words of praise from art institutions, artists' periodicals and advertising publications have been given the Elevated posters. Perhaps the most pointed of these was given by Lorado Taft, famous sculptor and artist, in a talk before the advertising council of the Chicago Association of Commerce recently while speaking on "Art in Advertising." "I look with interest on advertising posters," said Mr. Taft, "and there are some beautiful things appearing now and then, some of which are really perhaps our furthest advance in art. It is what we need all the time. There is a poster just out here and I would like to meet the man who drew it. I would like to speak to him. I haven't the least notion who he is, but they have got a good man at work advertising our elevated railroads, telling you what you can find in the city. The poster I refer to is the Peristyle at the north of Grant Park—that moon-

light and the columns there." This may be considered doubly important because of the recent move against unsightly billboard and poster advertising in the Illinois Legislature as well as in several other states.

The posters are in two sizes, known as three-sheet and one-sheet. The former are 42x84 in. and the latter 28x42 in. in dimensions. The work is done by the best Chicago artists, many recruited through the aid of the Art Institute, which heartily approves of the work done. Mr. Moran has followed the practice of allowing the artists free sway with their imagination as far as execution and ideas are concerned, usually merely suggesting the subject. Upon acceptance of the design the artist is remunerated for his efforts. Competitive bidding by the several lithographing companies is asked by the department before contracts for printing are let.

A NEW USE FOR YOUR
"L" PASS

FOR ONE WEEK
STARTING SUNDAY, MARCH 11,
THE
RANDOLPH THEATER
(STATE AND RANDOLPH)
WILL HONOR YOUR "L" PASS
AS ONE-HALF OF REGULAR
ADMISSION PRICE

An Unusual Privilege Granted to "L" Passholders by a Prominent Theater

Many of the designs submitted by these artists are used in billboard advertising of the Elevated. Contracts for boards in desirable places throughout Chicago are made with the Thomas Cusack Company, which applies the designs furnished, as well as executing many original designs. The subjects of these boards are usually points of interest in Chicago, such as railroad stations, shopping districts and places of amusement. These advertisements are more general in their character than the printed posters, the showing of which is confined to Elevated property.

As a sample of the good-will building faculties of the Elevated posters, Mr. Moran tells of an incident which occurred at a football game at the University of Chicago last fall which was attended by many persons from outside of the city. In order that traffic might be directed to the Elevated, several blocks distant from Stagg Field, Mr. Moran had a number of signs painted bearing a large arrow and the word "Elevated" in large letters. "We were placing these around the field by driving pointed sticks, on which the signs were mounted, into the ground," said Mr. Moran, "when a groundkeeper came running up and said such tactics were strictly against the rulings of the university. It so happened that we had recently featured the university in some of our advertising posters and I referred the man to the head of the public relations department of the university, who was acquainted with what we had done. As a result of an interview with him, we were allowed to continue unhampered."

Cost of Conducting Commercial Department

Figures as to the operating cost of the commercial department of the Elevated are not obtainable as yet because of its short life. It is the consensus of opinion of the management and executives, however, that it has paid for itself many times over in value received. The results are hard to set down in cold figures. In increased riding the gain is apparent, as well as an increase in friendly feeling and better public relationship. When children in their schools are taught the use of the Elevated and citizens of Chicago inspired with civic pride by the portrayal of their city's accomplishments in the line of beautiful parks and buildings, the Elevated has established itself in the hearts of the people in such a way that no amount of adverse criticism or petty politics can discredit it.

The Economic Situation of the Swiss Railways from 1913 to 1920

THE full text has just been made public of a résumé of the economic status of the Swiss railroads from 1913 to 1920, presented in abstract at the last International Street Railway convention in Brussels by Charles Rochat, general manager of the Geneva Electric Tramway Company. It is a volume of 112 pages and goes exhaustively into the subject of the economic situation of the trunk line railroads, mountain railways and tramways in Switzerland. The accompanying table gives some of the data on tramways contained in it.

In commenting on the situation Mr. Rochat says that the railroads in Switzerland before the war generally had a good financial status, but the war completely changed conditions and imposed a number of problems most difficult to solve. Surrounded as it was by four belligerents, France, Germany, Austria and Italy, Switzerland suffered greatly from the restrictions of imports and exports made by them, so that costs of supplies greatly increased, particularly of coal, oil and metal objects. At the same time the requirement of maintaining an army made labor scarce. The table shows the effect on expenses of these two items

An added factor, however, was new laws passed in regard to the hours of labor after the armistice, particularly the introduction of the eight-hour day. To the establishment of this condition may be attributed in large measure the resulting high expenses of operation and it has been the principal obstacle to a reduction in fares.

TABLE SHOWING STATISTICS OF SWISS TRAMWAYS, 1913 TO 1920 INCLUSIVE

	1913	1914	1915	1916	1917	1918	1919	1920
Length of line operated (in km.)	468	468	484	487	487	484	492	492
Passengers carried (in millions)	149.5	144	133	157	181	197	206	191
Passengers per car (or train) kilometer	4.7	4.7	4.4	4.7	5.3	5.7	5.7	5.5
Receipts from passengers (in millions of francs)	17.64	16.86	15.64	18.60	21.94	25.62	35.62	41.10
Receipts per passenger (in centimes)	12	12	12	12	12	13	17	21
Receipts from all sources (in millions of francs)	18.37	17.55	16.36	19.40	22.86	26.74	36.87	42.54
Operating expenses (in millions of francs)	14.99	14.74	14.04	15.68	18.32	24.60	34.89	38.73
Division of operating expenses in per cent of total:								
General	3.85	3.9	4.0	3.7	3.65	3.45	3.2	3.35
Maintenance of way and structures	14.2	12.6	11.6	10.6	10.5	10.3	12.0	12.2
Conducting transportation	23.0	24.0	24.5	24.0	25.0	25.0	28.0	27.0
Power and shops	51.0	51.0	52.5	53.0	52.0	48.0	47.0	46.5
Miscellaneous	7.0	8.0	7.4	8.7	8.7	13.0	9.3	10.5
Operating ratio (in percent)	81.57	83.97	85.80	80.80	80.10	92.0	94.6	91.0
Number of employees (in thousands)	4.58	4.79	4.70	4.82	4.94	5.35	5.56	5.50
Employees per 100 car (or train) km	5.3	5.7	5.7	5.3	5.3	5.7	5.6	5.8
Average cost of electrical energy in centimes per car (or train) km	8.1	8.0	7.9	7.9	8.1	8.0	8.1	8.4

The Readers' Forum

High Operating Cost Emphasized as Cause of Failure

AMERICAN ELECTRIC POWER COMPANY
PHILADELPHIA, PA., Aug. 7, 1923.

To the Editors:

I want to call your attention to the editorial in your issue of Aug. 4, entitled "Why Jersey Central Traction Company Has Been Abandoned."

It seems to me that while the facts alluded to in the editorial are all true and contributing causes to this abandonment, nevertheless, you have overlooked the really fundamental cause, and that is the abnormal rise in the cost of operation, particularly the wage cost. There are, unquestionably, in the country many roads which from twenty to thirty years ago would live, serve the public and produce a small return upon the investment, but which today cannot at any fare which the public will pay meet the increased cost of operation, more particularly, the payroll.

It seems to me from the standpoint of the industry that this point should be given due emphasis and not ignored entirely, and it is a point which I have been very careful to emphasize in all the discussion and proceedings which have led up to this abandonment.

C. L. S. TINGLEY, Second Vice-President.

[The editors have not been unmindful of the important effect of increased costs of operation in this, as in other instances, but the outstanding cause here seemed to be the steadily decreasing patronage of the railway.—EDITORS.]

Car Weight Important as Element of Rail Wear

CITY OF DETROIT
DEPARTMENT OF STREET RAILWAYS
DETROIT, MICH., July 26, 1923.

To the Editors:

The article on rail head wear, by Charles H. Clark, together with the editorial comment, appearing in the July 14 issue of the ELECTRIC RAILWAY JOURNAL, demonstrates the necessity of a comprehensive, unbiased and exhaustive investigation of not only the wear on the rail head from the number of cars which pass over it, including their weights and speed, but, in addition, the effect of weight of equipment on rails and the structures associated with them. R. B. Holt in his book, "Tramway Track Construction and Maintenance," has devoted two chapters to the subject of rail wear and rail corrosion; and numerous articles have appeared from time to time in the ELECTRIC RAILWAY JOURNAL bringing out to some extent the effect that the weight of equipment has on track structures as well as rail wear only.

The recent article confines itself exclusively to one type of rail, which type has less tendency to wear from vehicular traffic than the girder type more generally in use by street railways. A comprehensive investigation would cover all types of rail in general use.

From this article we infer that, given the number of wheels passing over a track, together with the depth of the rail head, the life of the track can be determined at once. This seems neither reasonable nor logical since there are numerous instances where the track life is well advanced though not due to rail wear. In order to estimate the life of a track structure it will be necessary to take into consideration other factors besides the number of wheel passes and rail-head depth.

It seems, therefore, that the effect of the weight of equipment and its relation to track as well as rail wear has not been taken into consideration. While it is true that when moving, a car possesses kinetic energy equal to one-half its mass times the square of its speed, and that, to stop the car, this kinetic energy must be absorbed, still this energy is not all absorbed by the track or rails. The question of impact, or the dynamic effect of a rolling load, would seem to have as much bearing on the life of the track structure as does the kinetic energy. Impact varies directly as the mass; consequently, a heavier car would cause greater initial damage, and the cumulative effect would increase much more rapidly than with a lighter car. Track deterioration from this cause would come from joint wear, inequalities in the rails and equipment, foreign matter on the rails, and irregularities in the track and rolling stock. This would effect the entire track structure.

That speed has little or no effect so far as impact is concerned, is brought out by F. E. Turneare and by E. H. Stone, in Vol. XLI of June, 1899, "Transactions of A.S.C.E.," and by F. W. Gardiner in Vol. LXXXIV, of 1921 "Transactions of A.S.C.E."

It would seem that the question as to whether tracks may be of lighter construction for the light-weight cars at present in vogue is one relating more to pavements and track structures than to rail-head wear. In this connection it would be interesting to have some information regarding the equipment passing over the worn rail section illustrated in Mr. Clark's article on page 47, since the illustration indicates a much greater wear per million wheel movements than the two instances noted in the text; namely, $\frac{1}{16}$ in. per 21,000,000 passes.

Mr. Clark has not mentioned the effect of grade or curvature, nor difference in the elevation of the two rails, nor has he made mention of the vehicular traffic, whether rubber or steel tired, in connection with rail wear. The composition of the rail would also have considerable bearing on the rail wear, as would the loss of metal from the corrosion of rails due to coal and other gases, particularly sulphurous gases from the burning of bituminous coal.

That not only our track engineers, but also the men in charge of equipment, are interested in this question is evidenced by articles in the ELECTRIC RAILWAY JOURNAL, from which a few quotations are included.

Dec. 11, 1920, Vol. 56, page 1195; extract from remarks by Frank Walker:

> Actually it was found that the safety cars were very easy on the track and the repairs required light. In some track formerly discontinued but now being rehabilitated for one-man car operation the company is putting in ties 5 ft. apart.

April 16, 1921, Vol. 57, page 736; extract from article by J. C. Thirlwall:

> The effect of weight on track and equipment maintenance is more difficult to determine. Obviously with light cars, the special trackwork, rails and joints will last longer and tie spacing can be increased, and with any given truck and motors, the lighter the body the longer the life of wheels, axles, truck members, brakeshoes and motor insulation. The longer and wider the body, the more it costs to repaint it and make the ordinary running repairs.

April 30, 1921, Vol. 57, page 820; extract from "Letters to the Editors":

> I, therefore, estimate that of the 65 per cent of the total which goes into track maintenance about 40 per cent is caused by weight, or approximately 25 per cent of the total.

May 28, 1921, Vol. 57, page 984; in an article by C. T. Dehore it is noted that the cost of maintenance of track and roadway per car-mile was 5.3 cents while the company was operating old-type heavy cars as against 4.95 cents with new light-weight cars. Also the proposed tie spacing was 3 ft. as against the existing 2-ft. spacing.

June 18, 1921, Vol. 57, page 1128; extract from article by W. G. Gove:

The track maintenance saving is prominently indicated, although I do not recall any figures on the subject.

Oct. 2, 1920, Vol. 56, page 644, in an article by J. C. Thirlwall, it is shown that the cost of maintenance of way and structures per car-mile is 1.6 cents for safety cars, 3.3 cents for two-man cars, or a saving of 52 per cent.

Oct. 16, 1920, Vol. 56, page 785; in an article by R. Gilman Smith, the same cost is given as 2.5 cents for standard double-truck cars and 2 cents for standard safety cars.

June 3, 1922, Vol. 59, page 894. Extract from staff article on Kentucky Traction & Terminal Company, Lexington, Ky.:

The savings in car and track maintenance can only be determined in the future operation of the property, except that the company believes that when new ties are laid the spacing can be increased to from 34 in. to 36 in. from the 24 in. now used.

July 8, 1922, Vol. 60, page 49; extract from editorial:

Such cars will decrease operating expenses directly per car-mile . . . . by decreasing the wear and tear on the track . . . .

Jan. 22, 1921, Vol. 57, page 177; extract from article by Harry L. Brown:

The track, much of which was open, was in bad condition, and while the old single-truck cars rode so roughly as to be dangerous, the safety cars, operating at higher speed, negotiated the rough track with no discomfort to passengers. Furthermore, the voltage drop on the line with the old cars was excessive, but with the new cars, fewer in number and each pulling less current, the voltage drop was not unsatisfactory. Thus the installation of safety cars enabled the company safely to defer track repair expense and avoid more investment in overhead copper.

Jan. 1, 1916, Vol. 47, page 21; extract from article by W. A. Haller:

Light efficient cars tend to reduce construction and operating costs in many ways, chief of which are the following:
3. Reduction in track maintenance cost, due to lighter weight and less pounding on special work and no slipping on curves.

June 14, 1919, Vol. 53, page 1182; extract from letter to the editors by R. C. Cram:

While you are pleading for the rails, please make a plea for the continuation of the efforts now being made to relieve the track of its unjust burdens by lessening the car weights. The ultimate savings in operating costs of all kinds to be gained by so doing are obvious.

Sept. 22, 1917, Vol. 50, page 496; extract from staff article:

It can be said, however, that 60-lb. rails, whether in brick, block, concrete or asphalt pavement, have not stood up under the shock of cars weighing 48,000 lb. or more. In fact, track put down in 1911 has already required complete overhauling instead of giving twenty years or more of real service.

Sept. 22, 1917, Vol. 50, page 501; extract from article by J. C. Thirlwall:

Hence the replacement of the heavier cars with these, even with 50 per cent more units, means a reduction of from 50 per cent to 60 per cent in the weight upon the rails. This will result in economies . . . . in track . . . . maintenance.
. . . . In view of these factors, some competent engineers assert that the maintenance of way and structures would be at least directly proportional to the weight carried over the rails; others say that a reduction of 50 per cent in the weight would result in not more than 25 per cent saving.

Sept. 29, 1917, Vol. 50, page 562; extract from editorial:

This maintenance saving has been variously estimated to be from 20 per cent to 60 per cent of present maintenance costs. . . . Certainly it will not be necessary to use 129-lb. rail with heavy welded joint construction and 6 in. to 12 in. of concrete underneath the ties where the rolling stock weighs no more than 16,000 lb.

Feb. 4, 1922, Vol. 59, page 195; extract from article by Pierre V. C. See:

Assuming that rail costs $6,000 per mile and will last ten years under the operation of the 62,000-lb. car, all conditions being equal, the rail on which the 42,000-lb. car is operated should last proportionately longer. Experiments on the strength of steel have proved that steel will break more easily under much fewer heavy blows than a large number of light blows. Upon this basis, our engineering department has figured the saving in the wear and tear of rail alone at approximately $250 per mile, per year.

Concerning ties, the average maximum life of a good grade of tie is approximately nine years. In other words, a tie will decay during that period to a condition where it is of no value. In the running of heavy cars, the rail will wear itself into the tie, thereby considerably shortening the life of the tie as compared to the life of the tie over which the lighter cars are operated. How much this amounts to is difficult to figure accurately, but it is safe to assert that the ties over which lighter cars are run will last at least one year longer. This being true, the average renewal per year under heavy traffic would be 300 ties per mile. Under the lighter traffic it is but 270 ties per mile, making a new annual saving of 30 ties per mile. At an average price of $1.30 each, this amounts to $39 per mile per year.

There is also a considerable saving in the reballasting of roadbed. What this amounts to, so far as our experiments go, is but an estimate, but our engineers are a unit in declaring that the saving is easily 10 per cent per year. Track and roadbed, labor and ballasting material costs have been approximately $750 per mile, and upon that basis the 10 per cent saving amounts to $75 per mile. The apparent saving is, therefore, to be summed up as follows: rail, $250; ties, $39; maintenance of roadbed, $75; total $364 per mile, or more than $6,700 annually for the roadway of the entire line.

Feb. 7, 1914, Vol. 43, page 295; extract from editorial:

. . . . Just so much extra weight to consume power, to wear out the track, and to make more expensive repairs.

Third Annual Report by Board of Supervising Engineers, Chicago Traction, page 258:

Weight—In designing electric street railway cars it is of greatest importance to reduce the weight as much as possiole consistent with the requisite strength and durability. The most important reasons for this are: . . . . 2. Increased life of track and special work.

It is interesting to note in Mr. Clark's article that track laid previous to 1902, which was removed from ten to twenty years thereafter, showed a decreased length of life; while the track which was laid after 1902 and removed after the same period, of ten to twenty years, showed an increased length of life. It was about 1902 that the weight of cars began to increase, and this increase continued practically until 1912, remaining at a maximum weight until about 1918 when the expense of operating the heavy cars was investigated, with the result that lighter weight cars began to be adopted. This indicates that track structures built for light weight cars would not stand up under the heavy equipment.

In 1909 M. V. Ayres, electrical engineer for the Boston & Worcester Street Railway, read a paper, which appears in the "Proceedings of the American Street Railway Engineering Association" for 1909. He went

into the matter very thoroughly, and, speaking of tracks, stated as follows:

It is evident that a certain part of the cost of track repairs would be incurred irrespective of use, as decay of ties and corrosion of metals, and injury from teaming would go on just the same. Otherwise, wear is evidently about proportional to ton-mileage. If track construction is much too light for the car weight, doubtless the wear would increase faster than the weight, but with tracks suitable to the traffic, it is probably closely proportional.

This subject is a very pertinent one at the present time, and the track engineers would be of great assistance to the industry by giving instances of their actual experience in connection with the wear of not only the rail head but the entire track structure, and the effect of different weights of equipment. It would seem that the present time is a proper one for data based on fact to be presented, as heretofore articles on this subject have stated opinions more than facts.

In order that the data may be useful to the industry at large, it will be necessary for contributors to state the general conditions surrounding each case. These conditions comprise operating speeds, weight and design of cars, traffic density, number and position of stops, use of brakes, grades and curvature, vehicular traffic and type, design of rails and car wheels, maintenance, and finally, composition and section of rail with type of track construction.

W. R. DUNHAM,
Executive Engineer.

Vocational Training at Nashville

For the Past Two Years Classes Have Been Held for Benefit of Local Electric Railway Men—Results Justify Continuance of Educational Efforts

THE Nashville Railway & Light Company has made an active start along vocational educational lines during the past two seasons. Preparatory to this work the company sent J. J. Connors, carhouse foreman, to a summer school at Minneapolis, Minn., conducted under the auspices of the Federal Board of Vocational Education. This school or conference was conducted by C. R. Allen and J. C. Wright, of the federal board. It was attended by 150 or more foremen, state representatives of the board, college teachers and others.

The conference continued thirty days, and those who completed its curriculum were given certificates stating their competency to lead foremen training classes. The Nashville company representative received one of these certificates. He also attended later a local class organized under the state vocational board and received a certificate for this work also.

During the winter of 1921 and 1922 there was conducted for the company a foreman conference under the auspices of the federal board through the state agent, James Arensten. Mr. Connors and Mr. Arensten conducted the classes. The program of the conference consisted in what is known as "job analysis," that is, study of the characteristics of different kinds of jobs, which forms so important an element in modern industry.

This conference included the foremen of the machine shop, "riptrack," wood shop, paint shop, armature room, carhouse and track, the overhead lineman, the powerhouse foreman, the superintendent of schedules, the safety director and the division superintendents. The registration was about twenty-five, and the average attendance, fourteen. The company gave a supper each week in its own restaurant to encourage attendance at the conference. The conference continued for six months, sessions being held on Monday evenings from seven to nine. There was no charge for this instruction.

Since the conference disbanded over a year ago, the results have been evident throughout all departments of the company, the foremen being able to pass over to the subordinates the lessons which they learned.

THE SECOND SEASON'S EDUCATIONAL PLAN

The next step in the educational program was the inauguration during the season of 1922-1923 of a course in electricity under the auspices of the federal board, but for convenience the sessions were held at the Watkin Institute in Nashville. The registration was twenty-two, and the average attendance eleven. This class continued from Dec. 19, 1922, to May 15, 1923, meetings being held twice each week, a total of four hours per week. Timbie's "Elements of Electricity" was the textbook used and it was about one-half completed. It is expected that the book will be completed during the coming season.

For this class a graduate electrical engineer was secured as instructor. He took up every-day problems, especially those that arise in the shops in which the members of the class were employed. There was no lecturing and the men were encouraged to discuss the subject, freely.

Lessons were assigned in advance, together with problems, the solutions of which were to be put on the blackboard before the class. No fee was charged for this instruction, as during the preceding season. As the class was not held in the company's quarters, it was impracticable to continue to furnish supper.

The management of the Nashville property is enthusiastic regarding the possibilities of this kind of training, and what has been done during the past two seasons can be considered merely a beginning.

Traffic Doubled on Recent Extension

IN THE first five months of operation the passenger traffic on the Westminster extension of the Buffalo & Lake Erie Traction Company has about doubled. Prior to Nov. 26, 1922, when the company extended its West Twenty-sixth Street line from the old city limits of Erie to a point 3½ miles farther west, service to this section had been given by the Cleveland & Erie Electric Railway. The latter company suspended operation in the early summer of 1922 and for several months this section had no railway service at all.

People having business in Erie experienced great difficulty in getting back and forth from their homes, and the Buffalo & Lake Erie Traction Company was finally persuaded to purchase and operate part of the abandoned line. Instead of the former hourly service with big two-man interurban cars, thirty-minute service is now provided with smaller double-truck one-man cars. Two fares are charged, one to the old city line and a second fare from there to Westminster.

The people of the district are very much pleased with the service and even go so far as to decline offered automobile rides to town lest the railway become discouraged by losing some business. Much new home building is in progress along the route of this extension and railway traffic promises to become increasingly profitable.

Association News & Discussions

Program Wisconsin Meeting

THE electric railway section of the Wisconsin Utilities Association will meet on Aug. 16 and 17 at Oshkosh, Wis., as previously announced in these pages. The program follows:

Thursday Morning

Address by Chairman B. W. Arnold, "Progress and Problems of Urban and Interurban Transportation in Wisconsin."

Address by Commissioner Andrew MacDonald, "What the Railroad Commission Expects of Operating Men."

Paper on "Urban and Interurban Track Problems" will be discussed by A. A. Oldfield, Eastern Wisconsin Electric Company; J. S. Hyatt, Chicago, North Shore & Milwaukee Railroad, and John St. John, Milwaukee Northern Railway.

Paper by W. G. Brooks, Westinghouse Electric & Manufacturing Company, "A Salesman's View of the Master Mechanic's Problems."

Address by Prof. James T. Rood, "What the University of Wisconsin Is Doing and Can Do for the Electric Railway Industry."

Luncheon at the Municipal Club.

Thursday Afternoon

An inspection trip to the new Oshkosh carhouse. Track under construction will be inspected en route. Inspection of new one-man interurban cars and de luxe coaches.

Demonstration by the Chicago Elevated first-aid team.

Baseball game, "Commercial Ambassadors" vs. "Transportation Dispensers."

Banquet at 6:30 with Prof. C. F. Hewitt, Oshkosh Normal College, as toastmaster, and an address on safety by Charles B. Scott, Safety Bureau, Chicago.

Dancing at 9:30 at Eweco Park.

Friday Morning

"The American Electric Railway Association and Its Services to the Electric Railways of Wisconsin," by James W. Welsh, executive secretary.

"Maintenance of Motor Vehicles," by Henry Cardell, Chicago, North Shore & Milwaukee Railroad.

"Bus and Coach Tires," by Howard Smith, sales manager General Tire Company, Akron, Ohio.

"Street and Interurban Transportation Problems," by Carl Allen, Wisconsin Public Service Corporation.

Friday Afternoon

Arrangements have been made for playing golf for those interested.

A program of entertainment for the ladies has been arranged for the convention, including shopping, bathing and boating, motoring, bridge and five hundred parties on the veranda at the Municipal Club, etc.

Mid-West Claim Agents' Association

THE third annual convention of the Mid-West Claim Agents' Association in Denver, recently concluded with the election of Travor C. Neilson, claim agent of the East St. Louis & Suburban Railway, and related companies, as president. In this capacity he will succeed W. C. Swisher, general claims attorney of the Kansas City Railways, Kansas City, Mo., who was elected at the convention held last year in St. Louis.

The other officers chosen were: S. G. Shaw, claim agent of the Denver Tramway, first vice-president; D. M. Finch, claim agent of the Des Moines City Railway, second vice-president; Charles B. Hardin, claim agent of the United Railways, St. Louis, executive committeeman at large; O. L. Borquist, chief clerk of the legal department of Kansas City Railways, secretary.

Training Oxy-Acetylene Welders

THE American Welding Society has just issued an outline of a course for the training of oxy-acetylene welders. This report was prepared by a committee and combines the experience of experts of the Federal Board of Vocational Education, the American Welding Society and the National Research Council for the information of the person who is selecting condidates, the text includes a discussion of the qualifications which the candidates for training should possess. For the information of the instructor, the text includes the fundamentals in gas welding, together with a detailed statement of content, classified under type welding jobs arranged in the order of difficulty. Copies may be secured from the American Welding Society, New York, N. Y.

Canadian Association's Secretary

EUSTACE SMITH, JR., who is executive assistant, Toronto Transportation Commission, has been appointed secretary of the Canadian Electric Railway Association, by H. H. Couzens, the new president.

A.E.S.C. Activities

THE American Engineering Standards Committee has taken under consideration for adoption as "American Standards" a number of new specifications proposed by the various technical societies. The principal ones of interest to the electric railway industry are those for line materials. The test methods for concrete materials, are approved as tentative standards.

The American Electric Railway Association has submitted its specifications for overhead line material for action by the A.E.S.C. A special committee to consider the question of sponsorship and scope of the specifications, which are also of direct interest to other than electric railway interests, is headed by A. H. Moore, representing the Electrical Manufacturers' Council on the A.E.S.C., and includes representation from the National Electric Light Association, American Railway Association, Electrical Manufacturers Council, American Institute of Electrical Engineers, American Electric Railway Association, American Short Line Railway Association, and the Bell Telephone System.

The attitude of the A.E.R.A., in submitting its specifications for this action by the A.E.S.C., will definitely favor the unification and elimination of conflicting specifications in this field, which is a very important one to a large group of industries, and involves expenditures of great magnitude annually in construction, maintenance and replacement of power, light, telephone, telegraph, and railway signal lines.

The following A.S.T.M., methods of testing materials entering into concrete have been approved as "Tentative American Standards" by the A.E.S.C.: Method of test for unit weight of aggregate for concrete; method of test for voids in fine aggregate for concrete; method of test for organic impurities in sands for concrete.

American Association News

Large Exhibit at Atlantic City Assured

PRACTICALLY all the space at present available for exhibits on the Million Dollar Pier in Atlantic City has been sold for the October convention of the American Electric Railway Association, and the exhibit committee is considering now with the pier authorities whether some arrangements cannot be made for additional room suitable for exhibits. The area sold up to Aug. 7 was 64,328 sq.ft. This includes all portions of the pier usually used for exhibits except some space in Aquarium Court which is being held for noisy exhibits or those which have some fire risk.

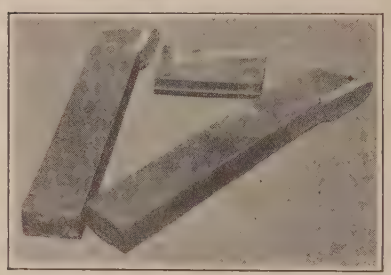
A list follows of the manufacturers to whom space has been allotted since the publication of the original applications on page 25 of the issue of July 7.

	Space
Albert & J. M. Anderson Manufacturing Company	28
American Car & Foundry Co.	410
American Steel & Wire Co.	551-553
Aluminum Company of America	308
Air Reduction Sales Company	200A
The Cleveland Fare Box Co.	402
Differential Steel Car Company	583
Federal Motor Truck Company	154-164 incl.
Gould Coupler Company	584-585
W. S. Goodwin Company	114
Hoover Body Company	303-305
Hubbard & Company	419
International Register Co.	537-539
Mack-International Motor Truck Company	301
Morganite Brush Company	535
Portland Cement Association	129
Rubberset Company	127
Standard-Johnson Company	622
Templeton, Kenly & Co., Inc.	582
Union Switch & Signal Co.	131
Van Dorn Coupler Company	404
Witherow Steel Company	109
Yellow Coach Manufacturing Company	313-315 317-319

Maintenance of Equipment

Tipping Tool Proves Economical

THE Lehigh Valley Transit Company, Allentown, Pa., has been welding tool steel tips on the larger sizes of cutting tools used in its machine shops. A common quality of bar steel is used for the shank. This bottom part is cut so as to provide a shoulder at the back of the tool steel tip to take the strain from the machining operation. Both the bottom and the tip are scarfed along the edges where they join and to provide for welding the tool steel tips to the bottom. This practice reduces the amount of tool steel required



Tool Steel Tips Welded to Bar Steel Shanks

and some very satisfactory results are being obtained. Tools used in the turning of wheels last for turning from eighteen to twenty-two pairs of wheels with one grinding. An accompanying illustration shows several tools that have been tipped in this manner.

An Adjustable Boring-Bar Holder

AMONG the various devices which are in use in electric railway shops for holding a boring bar on a lathe carriage, the adjustable type shown in the accompanying illustrations is one of the most convenient. These illustrations were made from photographs taken in the machine shop of the Virginia Railway & Power Company at Norfolk.

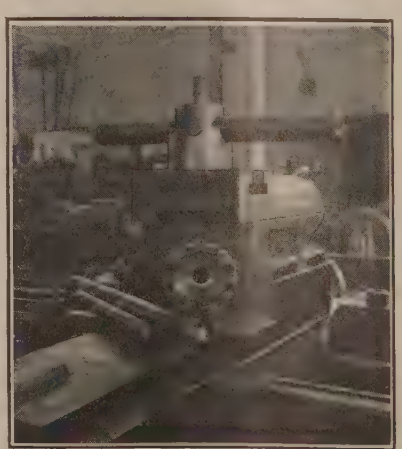
The body of the holder is cylindrical. A projection at the bottom has a head to fit in the T-slot of the lathe carriage, and an extension at the top is threaded to take a standard nut. A transverse hole drilled

Boring Bars Can Be Quickly Changed or Adjusted by Means of This Three-Part Tool Post

through the center is of sufficient diameter to clear the largest-sized boring bar.

Surrounding the body of the holder is a steel sleeve of such a length that when the bottom rests on the carriage the top comes to the middle of the hole in the body. This is machined to accommodate several sizes of boring bars, three in the case shown. Over the top of the body fits a cap bored out to match the sleeve. When this is drawn down by means of a nut, it clamps the bar securely in position and clamps the holder to the lathe carriage.

The illustrations show the three boring bars which go with the holder, one in position, the others lying on the base of the carriage.



The Clamping of the Boring Bar Is Rigid and Simple

Grease Keeps Water Out of Track Switches

THE East Massachusetts Street Railway is using motor grease in its boxes of spring track switches. It is found that this keeps the water out and the parts in good condition. A light grease, somewhat similar to that which would be employed in the differential box of an automobile, is used.

Repair Shop Builds Model Truck

A SHORT time ago the repair shop of the Connecticut Company at Hartford built for instruction purposes a truck about one-third standard size. This truck was provided with airbrake equipment complete and then placed in the in-

Model Board and Truck in Hartford School Room

struction room for motormen in the State Street carhouse in Hartford. It now forms part of the instruction equipment there.

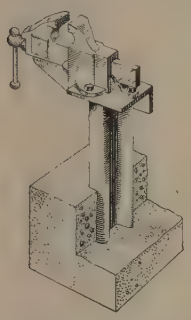
As illustrated, the motor electrical circuits are shown on the board in the upper part of the exhibit. Each of the four motors of a car equipment is represented by a model in relief of a motor, with armature and four field coils, each with a lamp, and a series of grid resistances. As the controller is turned, the separate lamps light up to show the connections. Above the board is a trolley by which power is taken from the overhead wire. The model also has a circuit breaker, air switch and door control.

Below on the platform is the

truck built in the Hartford repair shop. It is equipped with air brakes, controlled by an engineer's valve. Similar models are to be installed at the New Haven and Bridgeport instruction rooms.

Pedestal Vises Facilitate Repair Work

MUCH effort is wasted in the average repair shop in carrying work to and from the bench so that it may be held in the vise for various fitting operations. The West Penn Railways, Connellsville, Pa., has found it desirable to handle such work close to the job, either in the blacksmith or machine shop. For this purpose three vises have been installed at different points in the shop. These are standard machinists' vises with 8½-in. jaws, having a maximum opening of 12 in. Each of these vises is installed on an independent pedestal, made of old rail, which is set vertically into the ground, being sunk about 3 ft. beneath the floor. The rail is incased in concrete, making a very solid structure. The vises are about 3 ft. above the floor level of the shop. Being entirely separate from any work benches, these vises can be approached from any side, so that there is great freedom afforded the workman in handling parts in them. Their use has proved beneficial, has saved time on many jobs, especially those of fitting parts for truck work, and similar repair work.



The Vise Is Mounted on a Rail Imbedded in Concrete

Grease Gun Minimizes Waste of Lubricant

A CAPACIOUS and cleanly grease gun, made in the local shops, is used by the Newport News & Hampton Railway, Gas & Electric Company, in applying heavy grease. This consists of a tube about 3½ in. in diameter and 15 in. long, with an equal length of ¾-in. pipe projecting from the lower end.

The upper end is surmounted by a cap and nut through which travels a long threaded rod with an 8-in. crossbar at the top. A leather-packed piston is attached to the lower end of the rod. The piston rod is threaded eight threads to the inch, and a few turns suffice to inject a liberal supply of grease. The whole thing is under perfect control.

This gun enables grease to be placed in any location and is particularly effective in reaching inaccessible places which are frequently either over or under lubricated. A foot made of strap steel is attached to the cylinder to support the weight of the gun when it can be used in the position shown in the illustration.

A Practical Grease Gun Made at Hampton

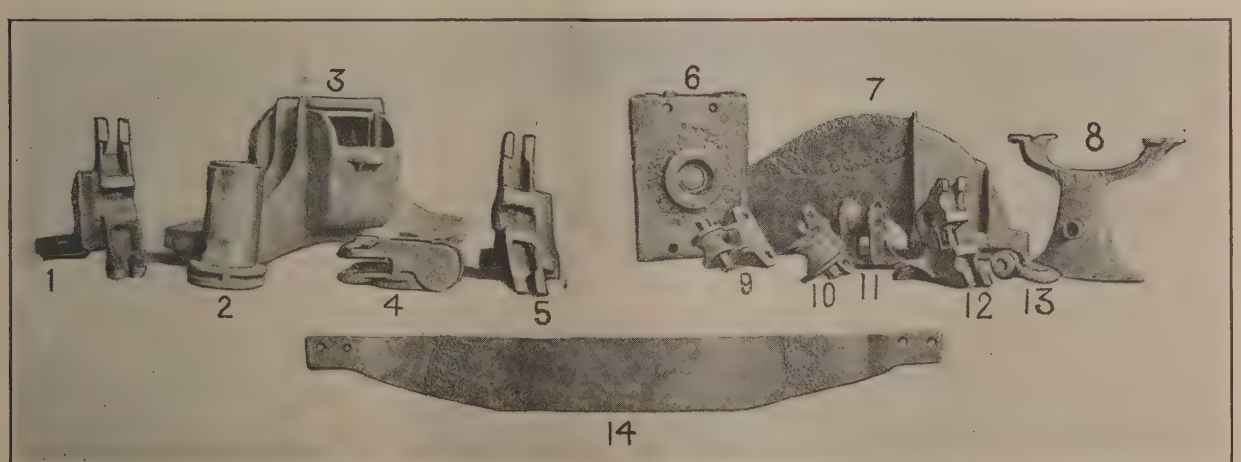
Typical Welding Reclamation Jobs

Illustrations Are Given of the Uses of Acetylene and Electric Welding—Savings Have Amounted to as High as $7,500 in a Single Month

IN THE SHOPS of the Nashville Railway & Light Company, of which George Swint is master mechanic, the use of electricity and acetylene in welding is highly developed. A number of the most successful jobs have been selected for illustration, particularly to show the reclamation of truck parts.

Reclamation plays such an important part of the shop activities at Nashville that in a single month as high as $7,500 worth of parts has been reclaimed. In the accompanying reproductions of photographs, taken recently in the Nashville shops, the several parts are numbered for identification. The salient facts regarding each of these jobs are as follows:

The pair of brakeheads for the driving wheels of the Brill 39-E



Samples of Reclamation Work on Truck and Other Car Parts Done in Shops of Nashville Railway & Light Company

Nos. 1, 5, 12. Brakeheads for Brill 39-E trucks.
No. 2. Bearing for GE-90 motor.
No. 3. Journal box for Brill 21-E truck.
No. 4. Brakebeam fulcrum.
No. 6. Center plate for Brill 39-E truck.
No. 7. Gear case for GE-57 motor.
No. 8. Pressed steel seat stand.
Nos. 9, 10, 11. Carriers for half-ball brake-hangers.
No. 13. Brake-rod clevis.
No. 14. Brake beam.

truck, Nos. 1 and 5 in the illustration, were welded on the toes and filled on the lute with an acetylene torch. The same is true of the brakehead for the pony wheels of the same truck, No. 12. Another acetylene job, No. 2, was on the bearing for the GE-90 motor. Here the dowel pin holes were filled in so that the bearing could be redoweled.

The journal box for the Brill 21-E truck, No. 3, was cracked at the junction of the arm and the journal box proper. It was welded as shown by means of the electric arc. Another electric welding job, No. 4, was the brakebeam fulcrum, the holes in which were filled in ready for reboring. The truck center plates, No. 6, had the wearing surface on the plates completely renewed by the use of acetylene. The malleable-iron gear case for the GE-57 motor, No. 7, was also repaired by means of acetylene welding, a patch of sheet iron being welded over a large break in the case. Still another acetylene job is the sheet steel seat stand, No. 8. The upper part of this stand was completely broken off, but was replaced and welded into position as good as new. The pressed steel was, of course, too thin for the use of the electric arc.

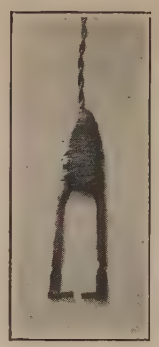
A group of jobs of particular interest are illustrated in Nos. 9, 10 and 11. These are brake-hanger carriers in which the seats for the half-ball hangers have become worn. The seats are not built up and resurfaced to a spherical curvature, but instead a bushing or spindle, a piece of heavy steel tubing, was welded into place with the acetylene torch in each case. When the truck parts are reassembled, the weight of the hanger is carried on the spindle instead of the original surface.

Two more electric welding jobs remain to be mentioned. One is the brake-rod clevis, in which the metal worn away by friction was replaced, with a little extra for good measure. The other is the brake beam or bar, No. 14, which had begun to crack at the inside bends. The cracks were filled in with new metal and a reinforcing layer was spread out generously in all directions from the cracks.

The illustrations which are typical of all of the work done in the reclamation department bring out the fact that the gas welding is used wherever the metal is thin, and for cast iron, brass, copper and aluminum. The electric welder is used for everything else.

Device for Lighting Acetylene Torch

IN THE shops of the Kentucky Traction & Terminal Company, Lexington, Ky., a handy gas lighter has been made to permit gas to be lighted by means of a short arc drawn between two small carbons. The carbons are mounted in clamps at the end of a pair of brass springs anchored on a tapered block of fiber. The carbons are about ¼ in. in diameter and an inch long, and they are held in place by friction. The device



A Safe Lighter for Gas Torches

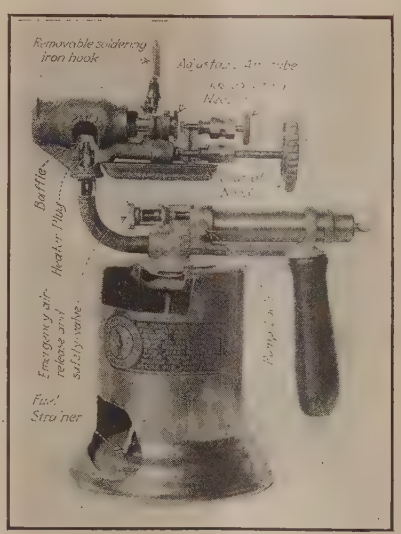
is attached to a lamp cord leading from the negative side of a 500-volt lamp circuit to hold the current down to a small value. The springs and handle are wrapped with adhesive tape.

The lighter is about 8 in. in length, and about 2 in. wide when the carbons are held in contact.

New Equipment Available

New Features in Blow Torch

A BLOW TORCH with a number of new and useful features is now being marketed by the Turner Brass Works, Sycamore, Ill. The fuel tank is arranged with but one



Sectional View of Improvement in Blow Torch

opening which is on top. This eliminates the possibilities of leaks from soldered connections and eliminates the hazard from fires, explosions, etc. A safety valve located at the end of the horizontal pump cylinder is fitted with a diaphragm which automatically opens and closes at 40-lb. pressure. As blow torches operate ordinarily at from 18 to 20-lb. pressure, this safety valve does not come into action until about double the normal pressure is obtained and the maximum limit of the safety valve is still well within safety.

An air release in combination with the safety valve is provided, which when opened after the operator has finished using the torch releases all pressure in the tank as an additional safety precaution. The pump is equipped with a leather that spreads like a parachute on the work stroke and closes on the return stroke. This leather is automatically lubricated from a reservoir containing vaseline.

In going from the tank to the combustion chamber, the fuel passes through the interior of a solid bronze baffle. The baffle is the obstruction in the burner on which the flame is constantly applied. Heating the fuel to a hot dry gas insures perfect vaporization of the gasoline or kerosene, thus generating more heat with lower fuel consumption, and without the danger of clogging.

The maximum admixture and combustion of oxygen is obtained by admitting air through a flared inlet in front of the needle valve instead of depending upon a multitude of holes in the burner tube. This inlet is a bell-shaped nut turned from brass stock an threaded so that the operator can screw it into or out of the tube, thus regulating the distance from the needle valve and consequently the volume of air admitted. The shut-off valve used to shut off the flame is a separate unit from the adjusting needle or orifice needle.

Another improvement consists in the provision of a pistol-grip handle. Special attention has been given to providing room for a large sized hand so that the torch can be handled without danger of tiring the user and without obstructing brackets.

The News of the Industry

Union Depot Proposed

St. Louis Engineer Wants East St. Louis Line to Have St. Louis Terminal for Fifty Cars

The engineers committee of the St. Louis-East St. Louis Railroad terminals, 1922, has reported on the question of the operation of cars of the East St. Louis & Suburban Railway over the Eads Bridge into St. Louis. The committee believes that appropriate steps should be taken by the company to accomplish:

1. The abandonment of the Eads Bridge for railroad traffic.
2. The use of the upper roadway for highway traffic free from toll.
3. The use of the present railroad tracks on the lower level for electric street and interurban cars.

The East St. Louis & Suburban Railway operates a very heavy electric car traffic over this bridge to and from a stub end station with two tracks at the west end of the bridge at Third Street and Washington Avenue, St. Louis. Its tracks occupy the same roadway as other highway traffic.

The suggestion has been made that tolls be removed from the bridge, in which event the engineers regard it as practically necessary to remove the electric cars from the upper deck and put them on the railroad deck. This they say, would not only largely increase the capacity of the highway roadway for handling traffic, but would also expedite the passage of electric cars and interurban cars across the river. These cars handle, in round numbers, 10,000,000 to 12,000,000 passengers per annum, who get on and off the cars at the west end of the bridge.

On account of the interference with St. Louis street cars and other surface traffic in the vicinity of Third Street and Washington Avenue it has not been considered feasible to have the East St. Louis street and interurban cars extend into St. Louis. They cannot operate on St. Louis street car tracks on account of different gages. As the engineers see it if the cars be placed on the lower deck of the Eads Bridge, their operation can be extended further west underground as far as may appear desirable. They suggest as an excellent site for a terminal for these lines the "Market Block," owned by the city of St. Louis, bounded by Broadway, Lucas Avenue, Sixth Street and Morgan Street, three blocks west and one block north of the present end of the Eads Bridge electric car tracks.

Such a plan would necessitate removing all railroad passenger and freight trains from the Eads Bridge and tunnel.

Charles S. Betts, engineer of the Department of Public Utilities of St. Louis, in his comments and recommendations to the committee says in part:

The logical solution for an Interurban Station would be to leave the present railway tracks on the lower deck of the Eads Bridge at about the alley east of Second Street then southwest to Third Street landing at Third Street and Washington Avenue with about nine tracks as per present plans with 20 ft. track centers, or 12 ft. between cars which serve as loading and unloading platforms, each line having its separate track to come in on and depart on.

In other words, we would have our Union Station duplicated for electric interurban cars. This arrangement would cause no confusion as every track is numbered. The advantage of this station would be that it is all above ground. The interurban cars are double ended and for this reason can use this proposed station without change of car equipment.

Another use to which this station might be put would be for a garage on the second floor with entrance on Eads Bridge adapted for East side autos.

The proposed station is contingent on the lower or railroad deck being turned over to the interurban roads and the use of the Municipal Bridge by the steam railways now using the Eads Bridge.

The plan of the proposed interurban station with track arrangements for fifty cars and a storage of twenty cars was submitted by Mr. Betts.

Interurban Lines Will Construct Freight Terminal

Plans of the interurban railways entering Indianapolis to construct a new freight terminal on Kentucky Avenue, where the freight depot of the Terre Haute, Indianapolis & Eastern Traction Company is now located, were recently approved by the Public Service Commission. As a result of the action of the commission, Indianapolis will have adequate interurban freight terminal facilities.

The order of the commission releases the Indianapolis Street Railway from the obligation of providing the freight terminals and leaves the interurban lines free to construct an adequate freight depot.

The plans call for the construction of an addition to the present freight house of the Terre Haute, Indianapolis & Eastern, and for the construction of a large new freight terminal. It is hoped to have sufficient additional facilities provided by Dec. 31, to take care of the freight of the Indianapolis & Cincinnati Traction Company and the Interstate Public Service Company. Construction of the new terminal is to be financed by the formation of the Terminal Realty Company, which will acquire additional ground at the Kentucky Avenue site. The company was authorized to issue $1,500,000 of preferred stock, to be sold at $96.10, and $750,000 of common stock to be held by the interurban companies.

Wage Offer Accepted

Montreal Trainmen Will Continue for Another Year at Present Pay—Adjustment for Shop Men

Of 2,088 union tramway men who cast ballots on July 31 in the referendum held by the Montreal Tramways Union, 1,211 members, or more than half of the entire number, voted to accept the offer of the Montreal Tramways and settle the wage dispute in that way.

The result of the referendum vote on the matter was as follows:

To accept the offer of the company, 1,211 votes.
To refer the wage dispute question to a board of arbitration, 195 votes.
Willingness to strike within forty-eight hours from the taking of the ballot, 661 votes.
Spoiled votes, 21.
Total number of votes cast, 2,088.

The offer of the company, which the men by a majority vote have decided to take, is to sign a contract with the employees for one year dating from July 1, 1923, at present rates, with certain readjustments in the company shops and outside departments. On the understanding that this offer is accepted, the company further promises to give consideration to the establishment of a pension fund for all the employees as soon as all the obligations under the contract with the city of Montreal are fulfilled.

Reduction in Day Asked

Motormen and conductors are now paid in most instances at the rate of 48 cents an hour, for a ten-hour day, time and a half being paid after that number of hours have been worked. The original demands of the union were for an eight-hour day, with the same pay as at present being received for the present longer work day.

The company declined to consider any advance in wages paid to motormen and conductors affirming that the wages of their employees have been increased 100 per cent since 1913, and are now 65 per cent higher than they were in 1918, while the cost of living for a family of five, according to the figures of the Department of Labor, was only 6.52 per cent higher than in April, 1918.

Decision to hold a referendum among the membership of the union was reached at a meeting on July 23, as the negotiating committee could see nothing resulting from further parleys with the company officials, and they wanted an expression of opinion from the men in order that the future policy of the union in this matter might conform to the wishes of the majority of the union members.

Interurban Asks Franchise

Ordinance for Entrance Into Cincinnati Provides for Right of City to Control Service and Fares

The Cincinnati, Lawrenceburg & Aurora Electric Street Railroad, through its attorney, Stanley Shaffer, has made application to the City Council of Cincinnati for a franchise to bring its tracks from Anderson's Ferry into the heart of Cincinnati. This is the most important step taken by the interurban company to enter Cincinnati over an elevated structure. The interurban company plans to make its Cincinnati terminus on Third Street near the Dixie Terminal, the northern terminus of the South Covington & Newport Street Railway. According to Mr. Shaffer, most of the new route, which is more than 7 miles in length, will be made over private right-of-way, nearly all of which already is held under option. The estimated cost of the extension is about $800,000. At the present time, residents of towns along the route are brought from their homes to Anderson's Ferry. Here they are compelled to board cars of the Cincinnati Traction Company to convey them to Cincinnati.

SERVICE-AT-COST FEATURES

The interurban company always was willing to make the extension, but it was impossible until the Ohio Senate repealed the Schmidlapp law, which provided that only a 5-cent fare could be charged on an elevated railway. On the basis of a 5-cent fare, it was impossible to make the extension. Last March the State Senate passed the Lipp bill, which gives City Councils power to fix rates of fares on elevated railroads in excess of 5 cents.

Under the terms of the ordinance, the city has control of the service, has the right to fix schedules and designate the number, type and design of cars to be operated. All rates, fares and charges of the interurban company are to be based upon the cost of service. A feature of the measure is the establishment of a "fare index fund" to take care of surplus gross receipts remaining after deducting depreciation and taxes, also interest on the bonds which will be used to build the extension. Upon commencement of the service the ordinance provides the company shall deposit to the credit of the fund $10,000. The ordinance specifies that when the fund exceeds $20,000 it shall be conclusive evidence that the rate of fare is too high or the service insufficient and therefore the rate of fare should be reduced or the service increased, as shall be mutually agreed upon between the city and the operating company. When the amount credited to the fund falls below $5,000 then it shall be evidence sufficient to prove that the rate of fare is too low and therefore the rate shall be increased or the service diminished. The rate of fare will be 10 cents between Cincinnati and Anderson's Ferry.

Mr. Shaffer said that Edgar Stark and C. E. Hooven, receivers for ten years of the interurban company, now have the system on a paying basis and soon will make their final report and be discharged. With the discharge of the receivers a new company to be known as the West End Terminal Railway, which was incorporated last fall with a capital of $10,000, will organize and take over the operation of the extension. This company also will issue bonds for the improvement.

Incorporators of the new company are: H. Lee Early, L. B. Patterson, Morgan Wamsley, and Dr. John Walton. These men are residents of towns along the route of the Cincinnati, Lawrenceburg & Aurora Electric Street Railway.

APPLICATION BEFORE COUNCIL

The application for a franchise has been referred to the Council committee of street railways for public hearings.

With the completion of the extension the length of the interurban line will be 40 miles.

Electric Railroad Between Los Angeles and San Francisco Contemplated

Recently the Santa Fe Railway system announced publicly that an appropriation was available to the amount of approximately $132,000 for conducting a complete survey for the construction of a new line between Los Angeles and San Francisco.

At the time of the survey considerable thought was to be devoted as to the most economical and feasible type of motive power to adopt. The Santa Fe's present connection for its steam road line on the Pacific Coast between Los Angeles and San Francisco is via its own line from Los Angeles to Bakersfield, thence from Bakersfield to San Francisco over the Southern Pacific Lines.

The Santa Fe system now has a budget for a $30,000,000 improvement program on the Pacific Coast, which involves double-tracking of several of its lines and the construction of several extensions. The proposed new line between Los Angeles and San Francisco will involve the greater portion of the budgeted amount, the estimated expense being about $25,000,000.

The line as proposed will be the shortest direct rail communication between the two largest cities of the state of California. At least 30 miles will be reduced from what is now the shortest rail route. The construction of the new line awaits the approval of President Story of the Santa Fe before actual work is undertaken. The surveyed route is stated to run from San Francisco to Bakersfield, thence south and west by the lines of least geographical resistance to the Tehachapi mountain range, thence by a system of many large and long tunnels into Los Angeles almost on a direct line.

It is stated that electricity for motive power will establish a precedent in extension work on an immense scale for the Santa Fe lines.

Six Per Cent Increase

Board Refuses to Grant Pay to Eastern Massachusetts Men Equal to Scale Paid on Boston "L"

A special board of arbitration has awarded an increase in wages to the employees of the Eastern Massachusetts Street Railway equivalent to about 6 per cent, or 3½ cents an hour. This award was announced in the ELECTRIC RAILWAY JOURNAL, issue of Aug. 4. The arbitrator for the men, James H. Vahey, dissented from the majority award, claiming that it was insufficient. Henry C. Attwill, chairman of the board, who is also chairman of the Massachusetts Public Utilities Department, announced the following new wage scale:

MOTORMEN AND CONDUCTORS	Cents an Hour
First three months	52½
Next nine months	55½
Over one year	58
One-man car differential	5
TRANSPORTATION DEPARTMENT	
Crossing tenders	54½
General helpers	54½
LINE DEPARTMENT	
Linemen	62½
" helpers	55½
STORES DEPARTMENT	
Helpers	54½
POWER PLANT	
Asst. eng.	70
Firemen	61½
Foremen of helpers	61½
Firemen helpers	58
General helpers	55½
Oilers	58
Pipe coverers	61½
Repairmen	59½
Substation operators	58
Switchboard operators	60½
Hoist. eng.	63

ROADWAY DEPARTMENT	Cents an Hour
Trackmen	54½
REPAIR SHOP AND ROLLING STOCK	
Blacksmiths	58
" helpers	54½
Babbiters	56
Carpenters	58
" helpers	54½
Car cleaners	54½
Firemen	58
Machinists	58
" helpers	54½
Painters	58
Pattern makers	58
Pitmen	57
" helpers	54½
Upholsterers	57
Watchmen	54½
Winders	59
" helpers	54½
Wiremen	58
" helpers	54½
Letterers	59½
Truckmen	59
" helpers	54½
Pipers	58
" helpers	54½
General helpers	54½
Electricians	58

In refusing to adopt the suggestion of the employees that their pay should be placed on an equality with employees of the Boston Elevated Railway, Mr. Attwill says:

In the instance of the Boston Elevated Railway the Commonwealth took over the management and operation of the property of the street railway company and guaranteed to the stockholders of the company the payment of dividends at a rate fixed in the act, while in the instance of the Eastern Massachusetts Street Railway the Commonwealth guaranteed nothing except the payment of certain serial bonds which might be issued by the trustees, which in no event were to exceed in the aggregate $5,000,000.

Undoubtedly the fact that the treasury of the Commonwealth stands behind the financial integrity of the Boston Elevated Railway and not behind that of the Eastern Massachusetts Street Railway is reflected in the difference in compensation heretofore paid to their employees.

In the one instance, if the compensation were made higher than the traffic would bear the deficit would be made up by taxes assessed in the communities in which the company operates, while in the other, if long-continued, a deficit would result in the company ceasing to operate.

Again, the Boston Elevated Railway is less likely to be affected by the competition of motor vehicles. Its gross revenue since its operation by the public trustees has steadily increased.

The gross annual revenue of the Eastern Massachusetts Street Railway has steadily decreased, rather than increased.

It is urged by the employees that no consideration should be given to the interests of the stockholders in the fixation of wages. Assuming this to be true, we must

give consideration to the credit of the company, as no public utility can hope long to succeed and furnish the service required for the public unless it is able to secure new capital to meet its capital expenditures. Such new capital cannot be obtained unless the conditions are such as to attract it.

Notwithstanding the desirability of making the service-at-cost plan a success, the public ought not, in my judgment, to expect to enjoy the transportation furnished by the Eastern Massachusetts Street Railway as at present organized unless it is willing to contribute in fare sufficient to pay the men who operate the transportation system a wage which is fairly comparable with the wage paid by other utilities furnishing a like service under similar conditions, particularly when there is no indication that such wage is likely to be reduced in the near future.

He referred to the necessity for the company, in order to exist, to change its system into a one-man car system. Further, that by this change the company had been able to show extraordinary improvement in its financial condition and that the situation was now very promising providing the company received the co-operation of the men and that competition by motor buses was eliminated.

Mr. Vahey in disagreeing from the majority award said that he believed that most of the reasoning was faulty and also that the increase granted was insufficient even from the point of view adopted by the majority of the board. He said that he disagreed in particular with the attitude of the majority in regard to the importance of financial questions in a wage determination. That these employees entered the railway service to perform certain specified duties. That they were not consulted about any of the numerous problems of construction and investment and that they must not be forced to take upon their shoulders any of the burdens created by unwise or unfortunate decisions of the present or past managements.

The "Co-operator" Offers Helpful Suggestions

The Department of Street Railways, city of Detroit, is publishing monthly for its employees the "Co-operator," to develop a personal relation between the officials and their subordinates, as well as between the employees in the different divisions of the department. Mayor Doremus in congratulating the editors of the "Co-operator" says that each person should be encouraged to do his best and that faithful or meritorious service should be rewarded by a word or two of appreciation. He said that the pamphlets should prove invaluable in bringing about a closer spirit of co-operation among the many employees.

Number 3 of Vol. 1 contains an instructive article entitled "Co-operative Carefulness," by H. B. Selden, claims attorney. Mr. Selden remarks in his article that during the month of June the Department of Street Railways had 2,080 accidents, the majority of which were due to heedless and irresponsible automobile drivers. He adds that absolute safety can be obtained only by the personal co-operation of every individual in the community.

This particular article is one of three written by three department heads in answer to the question: "What would you say if you could talk to the 3,500 platform employees face to face on what would tend to better co-operation on the part of the platform men in connection with the work of your division?" Two other articles helpful with suggestions were also printed in No. 3 issue of the "Co-operator." The authors of these articles are H. B. Gould, electrical engineer, and P. A. Kerwin, superintendent of tracks.

Must Explain Why Service Cannot Be Restored in Spartanburg

An order of the Supreme Court of South Carolina has been served on George B. Tripp, general manager of the South Carolina Gas & Electric Company, Spartanburg, requiring that he appear before that body in Columbia on Aug. 28 to show cause why full railway service should not be resumed in Spartanburg. The order followed the securing of the signatures of Associate Justice R. C. Watts, together with a copy of the supplemental petition of the city of Spartanburg asking for such an order.

The petition of the city claims that the Railroad Commission did not have the power to issue the order of June 22 which authorized the abandonment of service in the city of Spartanburg on July 21. The petition declares that the amendment of 1923 to the act enlarging and defining the powers of the Railroad Commission expressly denied to the commission authority to make such order. The petition charges that on July 22 and before the dawn of July 23, the company removed all of the trolley wires within the city of Spartanburg through which the power to operate its street cars was delivered; that said trolley wires and appliances were a valuable part of the property heretofore dedicated to the service of the public under the charter and franchise under which the said street railway was operated.

The city reviews the history of the controversy which dates back to January of this year. The events leading up to the order of the commission were told in these columns previously. The city in its petition prays that the court issue its writ of mandamus requiring and compelling the respondents forthwith to restore the trolley wires and appurtenances necessary to the operation of the electric railway system in the city of Spartanburg; to restore the torn up and dismantled portion of its railway track in the city of Spartanburg; to resume operation of its electric railway systems in the city of Spartanburg and restore and maintain adequate car service thereon, and for such other relief as to the court may seem just.

President Tripp stated that he had no comment to make concerning the move of the city to compel the traction company to restore railway service in the city. Service was abandoned on July 22.

Commission Engineers Drawing Up Subway Plans

Approval was given on Aug. 3 by the Board of Estimate of New York to the two Brooklyn-Manhattan subway routes.

F. D. Waterman, chairman of the Committee of One Thousand, which urged the prompt construction of a new subway in Brooklyn and another in Manhattan, wrote the Transit Commission about the need of haste by the commission in doing its part to provide these added facilities. He said it was up to the Transit Commission to draw up the plans, which in turn must go back to the Board of Estimate for approval in detail. Mr. Waterman said that the Committee of One Thousand would suspend its active campaign for the time being, but that it would not disband.

Chairman George McAneny of the New York Transit Commission said that that body would have its engineers begin on Aug. 6 the task of drawing up plans.

$60,000,000 Tunnel Project Under Way

Work has been started on the Staten Island tunnel, connecting Brooklyn and Richmond. There are to be twin tubes for the use of both passenger and freight traffic, and their length between portals will be more than 5 miles.

The estimated cost of the project is $60,000,000. With railroad connections at Bay Ridge, Brooklyn and at Arlington, S. I., the total distance involved will be about 10 miles. The subaqueous section of the new tube will be 10,500 ft.

The municipal tunnel under the Narrows was directed by a legislative act, passed in 1921, and construction is carried on under a War Department permit, issued last September. The project is designed to maintain the supremacy of the port of New York.

The first digging is the construction of the Shore Road shaft in Brooklyn. The contract for this portion of the job was awarded by the Board of Estimate to Patrick McGovern, Inc., for $495,000. It involves the furnishing and erecting some 1,300 tons of structural steel, placing of 5,000 cu.yd. of concrete and excavating 10,000 cu.yd. of earth under compressed air.

The same contractor received the award for the building of the St. George shaft on Staten Island. The agreement was signed last month.

The new tube will have tracks not only for railroad freight and passenger traffic, but there are plans to use the underground way for rapid transit. Engineers of the Transit Commission, however, expressed disapproval at putting subway trains in the same tube with railroad freight cars. This is one of the questions yet to be worked out. At all events, the Narrows tunnel will give a direct rail connection between the roads entering greater New York from opposite sides.

Arbitration Proceedings Under Way

Arbitration proceedings were started in Boston on Aug. 8 to settle the differences between the Boston Elevated Railway Company and its employees. George L. Mayberry, a Boston lawyer, has been agreed upon as the chairman of the board of arbitration with James H. Vahey representing the carmen and Charles W. Mulcahey representing the company.

There are five matters that the union officials and the company officials have been unable to agree upon, and which, therefore, went to arbitration. They are rate of wages; differential between wages of two-man car operators and the operators of one-man cars and buses; shorter working day on Sundays and holidays; one day off each week with pay; and increase in the eight-hour runs. Any adjustment which the board makes will be retroactive to July 1, and will remain in force one year.

The men are demanding 91 cents an hour, as a basic rate; they are now receiving 61 cents. They are demanding a large increase for the one-man car and the bus operators, up to $1.20 an hour for the latter if the two-man car operators should be awarded 80 cents. They want to work only six hours on Sundays and holidays, with pay for eight hours.

Love Your Enemies Slogan in St. John

"An eye for an eye, and a tooth for a tooth" is a philosophy with which the New Brunswick Power Company, St. John, N. B., has no sympathy. It believes in returning good for evil. For the past two years the company and the city of St. John have been in the throes of a conflict over the distribution of hydro-electric current. The company sought the right to distribute the current in St. John and suburban communities, while the city decided to install a civic distribution system, connecting with the hydro plant at Musquash River, 15 miles from St. John.

Despite the fact that the city has been installing poles, ornamental lights, transmission wires, distribution station, etc., in direct competition with the company, the company has not curtailed its scheduled plans for improvement in all services. New rails are now being laid through the principal streets of St. John. The roadbed in various parts of the city is also being repaired. Additional rolling stock is being purchased. Despite many rebuffs received from the representatives of the city, the company is improving its railway service.

Although the company is apparently passive in its attitude toward the city, yet it is going to fight, in its own way, the city's going into the light and power business. Substantial reductions have already been made by the company in house lighting rates. The civic distribution system that was to have been ready for operation in May is not yet ready and indications are that it will not be in operation until the latter part of August, and then only to a comparatively slight degree. The New Brunswick government insists that the city pay $12,000 for the month of June, although no current was used because of a contract entered into by the City Council of St. John, under the provisions of which the city guaranteed this sum to the government for June, whether or not current was taken.

The Federal Light & Traction Company is the new owner of the New Brunswick Power Company. Its management representative is Sanderson & Porter.

Jersey Men Still Out

President McCarter Insists Upon Comprehensive Settlement of Present Problem—More than Men and Money Involved

Efforts so far made to compose the differences between the Public Service Railway of New Jersey and its employees, now on strike, have all failed. In consequence local transportation in New Jersey in the territory formerly served by the company is still all being given by jitney. As President McCarter sees it, to use his own words, the matter has gotten beyond negotiations between the men and the company. He says that his statement still holds good that he will be glad to see the men any time they choose to confer with him, but "in the present posture of affairs I cannot conceive of anything that would be accomplished by such a conference."

Public Must Be Considered

This is the attitude taken by Mr. McCarter in a letter of Aug. 8 to President Osborne of the Board of Public Utility Commissioners, in which the head of the railway says further that "it is time for all who are charged with any responsibility in this matter to work out a comprehensive settlement." It was for this purpose, said Mr. McCarter, that he suggested a conference with the board in an earlier letter.

On the other hand, Mr. Osborne takes the attitude that the public is entitled to transportation facilities. He threatens that if the company and its former employees assume an arbitrary and unreasonable attitude, and thus make the prompt resumption of service impossible, "the present jitneys will be augmented sufficiently to give the public adequate permanent service."

He says that the desire of the company to protect the investment of its security holders is a duty of the company and that the men may desire to protect their jobs, but that in his view the company and the men should make further efforts to compose their differences. In the event of failure he says the board may then be called upon to act in accordance with its statement of Aug. 6. As a basis for negotiations he suggests:

1. An immediate conference between representatives of the company and the men.
2. An immediate temporary advance in wages, with a further increase after a seasonable lapse of time, the amount and the time to be agreed upon in conference and to be consistent with the prevailing wages in the industry and with the company's resources.
3. The taking of steps by the company to effect a reorganization if its financial structure to include the cutting off of non-paying lines not necessary to co-ordinate the service as a whole, where it is apparent that buses could better and more economically serve the public.
4. The seeking of co-operation of the various municipal authorities with a view to maintaining such service by bus as may be necessary, but restricting and rerouting buses so that ruinous competition may be reduced to a minimum and the public afforded a more comprehensive and efficient transportation system.

Mr. Osborne says that in agreeing to such a conference he would not consider either party committed to or bound in any way by the suggestions just set down. They were offered by him merely in the hope that both sides to the controversy, having a due regard for the public interest, might find in the suggestions a common ground for the adjustment of their differences.

Six-Month Permits Favored

Reverting to the statement of Mr. Osborne of Aug. 6, the chairman of the commission said at that time that unless the company and the employees were quick to compose their differences the board stood ready to approve so-called long-term permits for the operation of jitneys now running under the present emergency regulations. He said:

> The parties to the controversy should not lose sight of the fact that their paramount duty is to the public. They can accomplish nothing standing at arm's length. There can be no doubt that some reasonable settlement is possible and negotiations should now be in progress to that end.
>
> Unless an immediate effort is made by the company and the men to compose their differences, the Board of Public Utility Commissioners will indicate to the various municipalities affected its willingness to approve of long term permits for the operation of jitney buses to meet not only the present emergency, but to insure the public the future service to which it is entitled.
>
> The board will, furthermore, under the statute, call upon the Public Service Railway to show cause why it should not furnish safe, adequate and proper service as required by law and the provisions of its charter.

Thomas L. Raymond, Director of the Department of Streets and Public Improvements of Newark, in a statement on Aug. 6, declared that if the cars were not in operation by the next morning or if a plan for the immediate resumption of service was not placed in his hands by that hour he would issue 200 six months' permits to jitney owners.

The commission met on the morning of Aug. 9. Edmund W. Wakelee, vice-president of the railway, sent word to Mr. Osborne that the latter's suggestion made on the afternoon of Aug. 8 looking toward a conference of the company and the strikers would receive due consideration. At noon the board was reported still to be going over the entire situation with a view to possible further action. It was said unofficially at that time that the board might defer any definite action on its part until Saturday in view of the statement from Mr. Wakelee.

Mr. Mayo Makes No Promises for Detroit

William B. Mayo, the newly appointed general manager of the Detroit Department of Street Railways, in outlining briefly his policies, stated that he will make no promises as to the future, pending the completion of reorganization of the plant taken over by the city. The work of general manager has been taken up by him at the request of Mayor Frank E. Doremus, and he has assumed the duty as a citizen to offer his best efforts in helping the city solve its transportation problem.

The governing idea with Mr. Mayo is that the citizens of Detroit desire the best railway transportation regardless of the merits or demerits of public operation. As he sees it the Detroit system, as a result of years of unfortunate controversy, had stagnated. The first task is to build a stable foundation. After that has been achieved the much-desired and anticipated innovations and improvements will inevitably come.

Mr. Mayo expressed the opinion that the first problem, namely, the task of securing the confidence of the majority of the people, has been solved.

It was necessary to show, according to the general manager, that the system would be operated without politics; that no expense of the system had been assessed against the taxpayers and that there is no indication whatsoever that there will be.

The street railway officials are hopeful of being able to announce within a few weeks, definite plans for rebuilding the property—plans which could not be developed until the completion of the first year of operation and comparative monthly figures were available as a guide.

Mr. Mayo paid a tribute to employees. He further cited that the men in the Department of Street Railways are not only taking care of Detroit's transportation problems, but that they are in a sense buying the plant outright for the people within a ten-year period.

The report of the Bureau of Governmental Research was referred to in the ELECTRIC RAILWAY JOURNAL for July 7, page 34. The trustees of this bureau are all big business men, among them merchants, bankers and engineers.

Will Spend $65,000 in Electrifying in West Texas

The West Texas Utilities Company, with headquarters at Abilene, has purchased the Roby & Northern Railway, a line 4.542 miles long, extending from North Roby to Roby, and announces that it will spend $65,000 in electrifying this short line. Terminals will be built both at Roby and at North Roby.

The line was constructed in 1915 under charter from the state granting carrier privileges for fifty years. It was the second and successful attempt of Roby, county seat of Fisher County, to get rail connection with the outside world. In 1907 Roby citizens subscribed funds used to project a line from McCaulley to Roby, a distance of about 14 miles, but the financial panic came on and the road gave up its activity, leaving its construction locomotive, caboose and material stranded at Pledger, to which point in 1907 steel had been laid. Years went by before Roby undertook again to get in touch with the rest of the world.

Citizens of Roby in mass meeting May 1, 1915, decided to build, this time from North Roby, nearly 5 miles away, where connection could be made with the Katy. The road was chartered May 4, 1915, with a capital of $10,000, and, the line was completed in the latter part of the year. The first regular train was operated over the line Jan. 3, 1916.

Arbitrators Appointed to Settle Municipal Wage Dispute

Judge Harry J. Dingeman has been selected as the third arbitrator in the wage dispute between the Department of Street Railways and the employees of Detroit's Municipal System. He will act with the first two arbitrators selected, Judge E. J. Jeffries for the employees and Frank D. Eaman representing the city. Aug. 10 was set for the first meeting of the arbitrators.

Two important announcements were made regarding the dispute. One was that the question of wages and conditions of labor and these matters only would be submitted to the arbitrators without delay. The other was that the questions of recognition of the union and of open shop would be dropped from consideration for the present.

Officials of the union repeated their denials that the demand had been made for recognition of the union and the closed shops, the discussion of which, according to Mayor Doremus, was prohibited by the city charter.

On the municipal lines, platform employees now receive 56¼ cents, 59¾ cents and 62½ cents an hour with 75 cents an hour for overtime work in excess of eight hours. One-man car operators are paid 5 cents an hour more than other platform men. Employees of the D.S.R. are also given one week's vacation with pay each year.

News Notes

Ordinance Again Defeated.—The franchise providing for a renewal of the franchise rights of the Alton, Granite & St. Louis Traction Company in Alton has been defeated for the second time. Alderman Pastorius moved the rejection because the company had failed to deposit $50 required of firms or corporations introducing ordinances.

Men Seeking Increase.—The contract of the Macon Railway & Light Company, Macon, Ga., with the employees of the railway lines expired on Aug. 1. The men are demanding an increase in wages before signing a new contract. Under the old scale the wages were 36 to 54 cents an hour, depending on the length of service. The company has refused to grant the increase.

Limit of Service Reached.—At a hearing by the Transit Commission on Aug. 2 it was brought out by engineering experts that the rolling stock of the Interborough Rapid Transit Company, New York, N. Y., is not able to maintain a three-minute train schedule. The hearing was on an appeal by the traction company on the commission's three-minute order.

Working for Personal and Equipment Cleanliness.—The management of the East St. Louis & Suburban Railway has adopted a plan whereby all motormen and conductors who meet certain requirements as to cleanliness are given a one-day holiday with pay. Recently, President Sawyer wrote letters to thirty conductors and motormen informing them that they had won the coveted holiday. It is the aim of the company also to have the East St. Louis cars the cleanest of those in any industrial city in the country.

Insuring Employees. — The Public Service Inc., New Orleans, through H. B. Flowers, president and general manager, is soliciting group life insurance upon each of its 4,100 employees, men and women alike, with the view of presenting to each of them, without expense to the insured, a life insurance policy, the amount of the policy to be graded according to the seniority, in service, of the employee. The award will be made by contract, through competitive bidding. The total face value of the policies to be written under the contract is estimated at $4,100,000.

Closer Contact for Public Relations Department.—Transfer of the department of public relations of the Indiana, Columbus & Eastern Traction Company and the Columbus, Newark & Zanesville Traction Company from Springfield to Columbus, Ohio, will be made soon according to an announcement from headquarters in Springfield. The transfer will bring the department in closer contact with activities that are centralized at Columbus and permit it to function more smoothly. Arthur V. Bland, director of public relations, and Robert H. Bryant, William Culp, Paul M. Culp, and J. W. McCloy will go to Columbus as members of the department.

Company Purchasing Property. — Plans are rapidly being developed by the Monongahela West Penn Public Service Company, Fairmont W. Va., for a terminal in Fairmont. In connection with such plans several purchases of property in the heart of Fairmont have recently been made. The latest purchase made by the company is a lot in Fairmont on Locust Avenue. In view of the fact that the railway not long ago purchased what is known as the Arnett property at the end of the South Side bridge in Fairmont for a terminal site, it is not known just what use will be made of the Locust Street property but it is thought that the latter may be used as a temporary terminal.

Foreign News

A Novel Car at Hull, England

Experiments are now being conducted on the Hull city tramways with a car designed by E. L. Rayner, the general manager, which has several interesting features. The greatest novelty is a double worm drive. The whole vehicle is of specially light construction, as though it seats sixty-four passengers, its weight is only 8 tons. The stairway to the top deck is in the interior.

Suggested Improvements by London Employees

During the twelve months ended June 30, 1923, no fewer than 3,833 "Suggestions" were received by the London Underground Railway Company from the staff. Of these, 300 were accepted and awards made. Since 1917 a total of 22,850 "Suggestions" have been made and they continue to arrive at an average rate of 320 a month. The Underground Suggestions Bureau has been in existence in 1910.

London Underground Dividends

For the past half year the companies associated in the London underground railways group have, in addition to the payments on preference stocks, declared the following dividends on their ordinary stocks: Metropolitan District Railway, 1½ per cent (being the same as a year ago); London Electric Railway, 2 per cent (against 1¾ per cent); City & South London Railway, 2 per cent (compared with 1¾ per cent); Central London Railway, 2 per cent (the same as last year); London General Omnibus Company, 4½ per cent tax free (against 4 per cent).

London Traffic Regulation

At last there seems to be a prospect of something being done to constitute a general street traffic authority for Greater London. Such a step has been discussed and advocated for many years, but conflicting interests and politics have stood in the way. In face, however, of the growing street congestion, which has in many places become intolerable, the Ministry of Transport has for some time been directing special attention to the subject. In June and July the Parliamentary Secretary to the Ministry held conferences with representatives of local authorities, tramway and omnibus undertakings and others concerned, and the expectation is that in the coming autumn the government will introduce a bill in Parliament to deal with the subject. The scheme will probably embrace a wide area around London as well as the metropolis itself. A proposal that appears to find favor is that the Minister of Transport should be authorized to deal with problems of London traffic on the advice of a committee consisting of representatives of the Home Office, the Metropolitan Police, the county councils of London and surrounding counties, transport undertakings and transport workers. Probably a scheme of this kind would not meet with the opposition which might be raised in many quarters to the constitution of an independent expert traffic board with more or less autocratic powers. That such a board should be formed, with powers to initiate new schemes for transport, was recommended by a royal commission nearly twenty years ago, and varieties of the proposals have since then been put forward by various committees appointed to examine the question.

Cheap Railway and Bus Through Fares

The London Underground companies began an experiment on July 1 to bring the countryside nearer to central London by the introduction of through tickets from the principal stations in the central London area to the outlying country districts served by rural motor bus. These tickets will be issued on Sundays and bank holidays and will have the effect of cheapening the journey from central London and shortening the motor bus rides through the congested streets of the central area.

The combined fare for railway and bus is remarkably cheap. For a total distance of 16 miles the charge is 1s., and for 26 miles it is 1s. 9d.

Finance—A Great Improvement

The tramway accounts of the London County Council for the year ended March 31, last, show a surplus of £230,250 after payment of all charges including interest and sinking fund. For the previous year there was a deficit of £88,757. The total revenue was £4,895,605, as compared with £5,160,320 in the previous year. The working expenses were £3,660,577, against £4,386,891. The gross surplus was thus £1,235,028, against £773,429. After deducting cost of renewals, interest, sinking fund; income tax, etc., the net surplus was £230,250, as above. The working expenses (excluding renewals) per car-mile were 13.86d., compared with 17.68d., while the passenger receipts per car-mile were 18.13d., against 20.39d. The number of passengers was 733,811,367, against 688,151,316. For the current year it is estimated that there will be a net surplus of £78,617.

Operation to Start

The Domodossola Locarno Electric Railway in Northern Lombardy of meter gage and 1,500-volts d.c. will start operation the latter part of this summer. It gives a direct connection between Locarno, the Swiss city on Lake Maggiore, and Domodossola, the southern terminal of the Simplon Tunnel electric line. Although almost entirely on Italian territory, it will serve mostly Swiss traffic, as it is the only direct connection between the Swiss cantons of Valais and Ticino. The first consignment of motor and trailer cars has been received from the Carminati & Toselli Car Works, Milan.

More Underground Station Improvements in London

The last nine years have seen a great increase in the traffic at the two underground stations at Tottenham Court Road, London. In 1913 the number of passengers making use of both Hampstead line and Central London line stations amounted to 20,000,000. Last year the number had increased to 28,000,000. This remarkable growth in traffic has made it imperative for some scheme to be introduced whereby the transit of passengers from booking hall to platform level can be accelerated. Contracts amounting to £125,000 have been placed with Messrs. John Mowlem & Company and Messrs. Waygood Otis for what is virtually an entire reconstruction of these two stations.

The Central London station will be abandoned and the present Hampstead line booking hall beneath the road level will be enlarged and will act as a common booking hall for the traffic of both lines. Moving stairways will convey passengers from this common booking hall direct to the platform level. Further, the present arduous stairs and subway interchange between the two lines will be no longer necessary. Hampstead line passengers wishing to change on to the Central London line will be able to do so by escalator.

With a view to minimizing street accidents at this important junction where Tottenham Court Road, Charing Cross Road and Oxford Street meet, from the site of the present Central London station a subway will also be constructed connecting with the booking hall beneath the road. Passengers will therefore be able to gain the station without having to cross the road at this busy point. In the enlarged booking hall passimeters will also be introduced, thereby further speeding up the handling of the traffic.

When the improvements are completed, not only will congestion be entirely avoided but it is estimated that the time taken between entering the booking hall and reaching the platform will be reduced by half a minute. It is estimated that five seconds per train will be saved in the loading of the northbound trains to Highgate and Golder's Green during the rush hours by the introduction of escalators.

Track Switches in Milan

The Milan municipal railway has decided to install electrically operated track switches at a large number of busy traffic points. The switches so far installed are of Oerlikon make. Switchpoints and frogs are mainly of Edgar Allen, Ltd., Sheffield.

Financial and Corporate

Cuban Company Makes Good Showing

Railway Department of Company in Havana Shows Net Earnings Increase of 15.1 per Cent in 1922

The net profit of the Havana Electric Railway, Light & Power Company for the year ended Dec. 31, 1922, was $2,235,881. So far as the railway department is concerned the results showed a decrease of 3.96 per cent in gross earnings, but an increase of 15.1 per cent in net earnings compared with 1921.

CONDENSED PROFIT AND LOSS ACCOUNT OF HAVANA COMPANY FOR THE YEAR ENDED DEC. 31, 1922

	Railway Department	Light and Power Department	Total
Gross earnings from operation	$5,756,438	$7,154,268	$12,910,707
Operating expenses	3,689,592	2,262,856	5,952,449
	$2,066,846	$4,891,412	$6,958,258
Deduct			
Taxes, U. S. A.	$20,746	$28,000	$48,746
Taxes, Cuba	33,400	271,000	304,400
Trigo Annuities	3,373	.....	3,373
Interest	616,188	470,819	1,087,007
	$673,707	$769,819	$1,443,526
	$1,393,139	$4,121,593	$5,514,732
Deduct			
Reserve for depreciation	$589,370	$1,710,629	$2,300,000
Reserve for contingencies	153,749	446,252	600,000
	$743,119	$2,156,881	$2,900,000
	$650,019	$1,964,712	$2,614,731
Add			
Interest on deposits			$88,122
Income from securities			18,554
Rents			38,190
Other miscellaneous income			44,187
			$189,053
			$2,803,784
Deduct			
Miscellaneous accounts written off, net		$120,468	
Amortization of discount and expenses on funded debt		130,557	
Provision for sinking fund of thirty-seven-year English 5 per cent mortgage bonds of compañia de Gas y Electricidad de la Habana		15,949	
Provision for sinking fund of consolidated mortgage 5 per cent gold bonds of Havana Electric Railway		131,666	
Provision for sinking fund of general mortgage 5 per cent sinking fund gold bonds of Havana Electric Railway, Light & Power Company		135,513	
Premium on redemption of five-year 7 per cent secured convertible gold notes, dated Sept. 1, 1921		33,750	567,903
Net profit for the year, carried to surplus account			$2,235,881

At the beginning of the year 1922 the operating schedule required 434 cars on week days and 435 cars on Sundays. During the year it was increased to 443 cars on week days and 452 on Sundays and one new line was added, making the total thirty-five. The largest number of cars in circulation at one time was 478 on March 5, Piñata Sunday, the second Sunday of Carnival.

For the first time since 1915 the railway earnings decreased. The increases in 1921 and 1920 were unprecedentedly large. If, instead of taking the actual figures for the past three years (1920, 1921 and 1922), the figures are extended over the average rate of increase found in 1916 to 1919 inclusive, the results are within 3 per cent of the actual earnings.

Just as in the two other principal departments, the feature of the year was the increase in net earnings due to the reduction of operating expenses, and it is worthy of note that the gain in net earnings was more than $100,000 greater than it was in 1921, although in that year there was also an increase of 18 per cent in total earnings. The saving in 1922 was due to the combination of several factors, the salient ones of which were: the readjustments of wages of common labor in July, 1921, of conductors and motormen and carhouse men in September and October, 1921, and of shop men in February, 1922, the lower cost of fuel for the power plant, reductions in the cost of all maintenance material, and improvements in the organization and equipment of the shops and the track department, all of which will be further described under the appropriate headings.

There were no labor disputes and relations with the entire personnel of the railway division were excellent. The readjustment of the pay of mechanics and other skilled workmen, in February, was combined with a number of changes and improvements in the classification and distribution of work, especially in the car shops.

The total payroll of this division was reduced by about $3,500 per month.

The results obtained from the new model cars put in service in 1921 and 1922 were so satisfactory that it was decided to build more of them instead of reconstructing cars of the old type that were too short to accommodate eighteen seats. Eight were built for replacement in 1922.

STATISTICS OF RAILWAY SERVICE AT HAVANA

	1921	1922	Increase over 1921	
Total number of passengers carried	116,272,911	113,011,816	3,261,095*	2.80%*
Passenger car miles	17,624,763	17,532,658	92,105*	0.52%*
Passenger earnings	$5,813,645.55	$5,650,590.80	$163,054.75*	2.80%*
Passenger earnings per car mile	32.99	32.22	.0077*	2.33%*
Total earnings from operation	$5,993,610.70	$5,756,438.47	$237,172.23*	3.96%*
Total operating expenses	$4,197,911.11	$3,689,592.87	$508,318.24*	12.10%*
Total operating expenses per car mile	23.82	21.04	.0278*	11.67%*
Operating ratio	70.40%	64.10%	.....	.....
Net earnings from operation	$1,795,699.59	$2,066,845.60	$271,146.01	15.10%

*Decrease

New York Lines Improve

City Lines Taken as Whole Show $339,693 Net Corporate Income for Ten Months

The street railway lines of New York, including the subway and elevated companies, for the first ten months of the fiscal year 1922-1923, that is, from June to April, inclusive, show a materially improved financial condition, according to figures compiled from the monthly reports of the companies and made public by the New York Transit Commission. The companies, taken as a whole, show a net corporate income of $339,693. For the corresponding ten months of last year they showed a deficit of $3,110,532.

The reports for March and April show the highest mark yet reached by the various lines in their recovery from the conditions arising out of and following the war.

The tabulation below gives the results by months, those months in which there remained an actual deficit, namely, July, August and September, 1922, and January and February, 1923, being indicated:

Month			Net Corporate Income or (D) Loss	Improvement Over Corresponding Month of Last Year
July,	1922	D	$135,977	$516,869
August,	1922	D	380,630	214,142
September,	1922	D	158,132	96,007
October,	1922		90,062	431,342
November,	1922		61,696	178,170
December,	1922		169,268	247,054
January,	1923	D	10,849	273,900
February,	1923	D	369,462	160,467
March,	1923		510,286	340,046
April,	1923		563,422	312,836
			$339,693	$2,770,838

In April the subway and elevated lines of the Interborough and the former B. R. T. companies showed a combined net corporate income of $357,401. The net corporate income of the Interborough subway lines amounted to $312,557, and of the B. R. T., now the B.-M. T. rapid transit lines, to $159,022. The Manhattan elevated lines of the Interborough system, however, despite the efforts which have been made to build up traffic on those lines, still showed a deficit of $114,178.

The surface lines of the city had $206,020 net corporate income for April. The best showing was made by the Brooklyn City Railroad, with net corporate income of $221,513. All of the Brooklyn surface companies showed net corporate income except the Brooklyn Heights and the Coney Island & Gravesend companies, which reported deficits of $59,743 and $12,142, respectively.

The New York Railways showed an April balance on the wrong side of the ledger of $152,881. This large deficit, however, was in part offset by the net corporate income of $83,483 reported by the New York & Harlem, operating the Fourth and Madison Avenue lines, and by small net incomes for other companies, so that as a whole the surface lines on Manhattan Island showed a net corporate deficit of $70,900.

All of the lines in Queens showed

deficits, while in Richmond, though the Richmond Light & Railroad Company showed a net corporate income of $51,338, the municipally operated Midland lines showed a deficit of $1,452.

The Transit Commission has also made public abstracts of the reports of several of the companies for the month of May. Among these companies the Interborough showed a net corporate income of $240,659, an increase of $248,648 over May, 1922, when a deficit of nearly $8,000 was reported. The subway lines in May showed a net corporate income of $301,473, an increase of $38,445 over May, 1922. The deficit on the elevated lines for May was $60,814, as against $271,017 in the previous May. The big drop in the elevated deficit is, of course, due largely to the Interborough reorganization, under which, at the instance of the Transit Commission, the fixed charges of the company, in respect of its elevated obligations, were greatly reduced.

The New York Consolidated Railroad, now the New York Rapid Transit Corporation, of the B.-M. T. system, showed for May a combined net corporate income of $237,681, as against $162,656, a gain for the year of more than $75,000.

The Third Avenue Railway system, consisting of the Third Avenue Railway, the Union Railway in the Bronx and other controlled companies, showed a net corporate income for the month of $52,568, which was, however, a decrease of $16,981 from the May, 1922, figures.

The New York Railways, through its receiver, Job E. Hedges, reported a net deficit for May of $150,475, as against a deficit in May, 1922, of $123,332.

The Interborough in May, 1923, carried 91,670,511 passengers. This was slightly over 4,000,000 more than in May, 1922. The New York Consolidated's May passenger traffic was 45,132,423, an increase of about 4,700,000 over the previous May. The Third Avenue system, with 5,316,509 May passengers, showed a falling off from May, 1922, figures of 139,000. A decrease of passengers carried was also shown by the New York Railways report, the traffic of 13,687,205 being less by 960,899 than that in May, 1922.

Wisconsin Railways Earned 3.12 per Cent in 1921

Due to the ever-increasing demand for gas, electric, telephone and electric railway services, the public utilities of Wisconsin show a tremendous growth in the amount of money invested in the business, in the total revenues received and in the number of customers served. These facts are all brought out in the latest report of the Railroad Commission of Wisconsin, which does not include the figures for 1922.

The investment in electric railways and city lines also showed an increase, although here, too, the increase was not nearly so marked as in the case of electric utilities. The property and plant accounts for 1921 totaled $83,018,480, as compared with $80,229,520 in 1920 and $72,534,563 in 1917. While the operating revenues increased from $11,323,223 in 1917 to $20,300,808 in 1920, by the end of 1921 they had dropped to $19,662,146.69. The rate of return for electric railways is much smaller than that of any other utility. In 1917 the rate of return was only 4 per cent. By 1920 it had dropped to 2.76 per cent. Although 1921 showed a better return than 1920, the rate was only 3.12 per cent.

The total amount of capital invested in all electric utilities in Wisconsin was $116,564,856, an increase of $12,064,488, or 11.5 per cent over the property value of 1920, and $44,528,615, or 61.8 per cent over that in 1917. The rate of return for 1921 on the money invested was 6.99 per cent.

Street railways carried in 1920 287,905,241 passengers and in 1921 265,392,587, a decrease of 7.8 per cent.

Boston Elevated Pays Back $1,631,753

Five years have now elapsed since the operation of the Boston Elevated Railway passed into the control of trustees appointed by the Governor of the Commonwealth. During the first year increasing costs of operation exceeded the revenue obtainable under a 5, 7 and 8-cent fare. An actual deficit occurred of $5,415,500 divided as follows:

$1,000,000	in the reserve fund exhausted.
3,980,151	assessed against cities and towns
435,348	back pay occuring in May and June, 1919, under an arbitration award.

At the present time the $1,000,000 reserve fund has been restored, the $435,348 back pay has been absorbed, and two payments, one of $517,196 and the other of $1,114,557 have been made to the cities and towns. Therefore 57 per cent of the 1918 deficit has been overcome, leaving $2,348,397 still due the municipalities. Edward Dana, general manager of the railway, said:

> Our efforts cannot in the public interest be directed solely along one line. We have, however, made creditable reduction in the deficit, reduced the fare (26 per cent of the riders or 100,000,000 a year now ride for 5 cents), and we have improved the service with new cars, new track and increased mileage.
>
> We are proud of our calling and we have proved that co-operation gets results.

COMPARATIVE DIVISION OF RECEIPTS AND EXPENDITURES OF THE BOSTON ELEVATED RAILWAY FOR THE YEARS ENDED JUNE 30

	1923	1922	1921	1920	1919
Total receipts	$33,612,335	$32,781,493	$34,224,149	$32,689,200	$25,223,495
Operating expenses:					
Wages	$15,024,348	$14,920,407	$16,753,669	$16,381,207	$13,554,685
Material, supplies and other items	3,149,688	3,056,520	2,899,983	3,321,671	4,096,537
Injuries and damages	700,741	476,844	627,629	627,626	805,353
Depreciation	2,004,000	2,004,000	2,004,000	2,004,000	2,004,000
Fuel	2,027,712	1,656,012	2,399,277	1,996,717	1,901,596
Total operating expenses	$22,906,489	$22,113,783	$24,684,558	$24,331,221	$22,362,171
Taxes	$1,722.707	$1,610,097	$1,306,738	$1,075,497	$941,612
Rent of leased roads	49,194	2,549,625	2,673,166	2,607,567	2,587,129
Subway and tunnel rents	2,025,263	1,974,141	1,947,963	1,591,323	1,491,999
Interest on B. E. bonds and notes	2,277,051	1,483,787	1,483,625	1,593,257	1,423,144
Miscellaneous items	65,986	58,475	54,479	69,284	37,372
Dividends	3,136,854	1,606,372	1,523,367	1,403,971	1,360,220
Total cost of service	$32,183,545	$31,396,281	$33,673,896	$32,672,120	$30,203,647
Gain	$1,428,789	$1,385,211	$550,253	$17,079	
Loss					$4,980,152
Back pay applying to May and June, 1919, but paid in October, 1919					$435,348
					$5,415,500

Stockholders Win Fight Against Mortgage Payment

Stockholders of the old Cincinnati, Dayton & Toledo Traction Company won a second victory in their fight against paying the balance of a bond mortgage of the extinct Southern Ohio Traction Company, when the Court of Appeals at Cincinnati handed down a decision affirming Common Pleas Judge Stanley C. Roettinger's action in sustaining demurrers which they had filed to the suit to assess stockholders' liability against them. As a result of the decision, approximately 4,000 stockholders of the Cincinnati, Dayton & Toledo escape paying approximately $1,000,000 to the holders of the Southern Ohio Traction Company's bonds.

The Southern Ohio Traction Company was organized in 1900, when the old double liability law was in force. When the Cincinnati, Dayton & Toledo and its subsidiaries consolidated and took over the Southern Ohio Traction, the Ohio constitution had been changed and single liability only was in force, and while the new company assumed all the debts of the old, its contracts specified and its stock certificates contained the specification that the new stockholders were not to be liable for the bonds issued by the Southern Ohio Traction Company.

When the bondholders sued to enforce stockholders' liability to pay the balance due on their bonds, after the sale of the mortgage security, it then was claimed that it was against public policy to relieve the new stockholders of liability on the old bonds, but the Common Pleas Court sustained a demurrer to this, and the matter went to the Appellate Court. In its decision the Court of Appeals says that the contract was between individuals and no public right was affected by it in any way, and, therefore, it was not a matter which comes under the rule of public policy, but one which must stand entirely upon the wording of the contract made when the money was lent. In other words, the decision declares that a debtor cannot change his security by claiming his contract is against public policy.

These bonds, aggregating $1,000,000, are held by the Cleveland Trust

Company. They were issued by the Southern Ohio Traction Company, which was formed by the consolidation of three lines between Cincinnati and Dayton, and the trust company sought to hold the stockholders of all these subsidiaries and of the Cincinnati, Dayton & Toledo Traction Company, which later was formed and took over all the properties. Under the decision by the Court of Appeals, which was written by Judge Wade Cushing, and concurred in by Judges Robert Z. Buchwalter and Francis M. Hamilton, the Cleveland Trust Company is stopped from recovering from these stockholders.

Reorganization Plan for Michigan United Modified

Securities of the new company to succeed the Michigan United Railways, sold recently under foreclosure to the reorganization committee, are expected to be ready for distribution about Oct. 1. The sale was conducted on June 30. It has already been confirmed by the court. Application is now before the Michigan Utilities Commission for approval of the issuance of the new securities.

In this connection it has been announced that the plan of reorganization has been changed slightly, more nearly to meet the ideas of the holders of some of the outstanding issues of securities. The work necessary in connection with the adjustment of this matter had the effect of delaying the reorganization, but the matter is believed now to be moving fast toward conclusion.

Objections to the plan came from certain holders of the debentures and of preferred stock who contended that the plan did not yield to holders of the debentures and of preferred stock of the old company securities having a preference over the securities yielded by the plan to the holders of the common stock of the present company. The amendments which have been adopted by the committee may be summarized as follows:

1. The preferred stock to be distributed to bondholders will be called "Class A preferred stock," but will remain unchanged in preference position, dividend rate and all other respects.
2. Subordinate to the Class A preferred stock, a Class B 5 per cent non-cumulative preferred stock of an aggregate face value of $400,000 will be created. This stock will be sold to provide funds for paying reorganization expenses.
3. Subordinate to the Class A preferred stock and also to the Class B preferred stock, a Class C 5 per cent non-cumulative preferred stock will be created and distributed among depositors of debentures and of preferred stock of the present company; the debenture holders to receive one share of Class C preferred stock for each $100 of debentures deposited; and the preferred stockholders to receive one share of Class C preferred stock for each two shares of the old preferred stock deposited.
4. The bonds to be issued and sold provide funds with which to retire the Jackson & Battle Creek Traction Company underlyings, or for the purpose of exchange for Jackson & Battle Creek underlyings have been increased from $1,200,000 face amount to $1,400,000 face amount.
5. All rights of subscription to the securities of the new company have been eliminated. Inasmuch as none of the rights provided by the original plan were exercised, the committee deemed it unnecessary to carry such rights into the amendments.
6. No common stock is offered to depositors of debentures or of preferred stock of the present company and no common stock is offered for sale to provide funds for reorganization expenses. All of the new common stock is given to the holders of the common stock of the present company.

Hearings on Bronxdale Boulevard Resumption

Two hearings have been held before the New York Transit Commission to determine whether the Bronx Traction Company, a subsidiary of the Third Avenue Railway system, shall be ordered to resume service from Bronxdale Boulevard to Williamsbridge Road in Morris Park Avenue.

No service has been operated on this part of the line for several years. The city is contemplating the paving of Morris Park Avenue in the stretch covered by the railroad, which will require the relocation of the trolley tracks. The company seeks to abandon the tracks beyond Bronxdale Boulevard, and has filed an application to that effect with the commission. Witnesses called by the commission testified that the tracks are still in the street and could be operated in their present condition, with slight repairs and the setting of new trolley poles, but if the street is to be paved, more work would be required. It was brought out at the second hearing by the company that to add one car which would be required for the operation of the additional half mile, would cost $65 a day—a sum which would require 1,300 passengers to meet operating costs alone. The commission witnesses asserted that this figure was absurd. The case was taken under advisement by the commission.

Auction Sales in New York.—At the public auction rooms of A. H. Muller & Sons there were no sales of electric railway securities this week.

Six Months' Net $779,650.—The net income of the Market Street Railway, San Francisco, Calif., for the month of June was $120,816. For the six months ended June 30, 1923, the net income totaled $779,650.

Passengers Increase. — The United Railways of St. Louis during the quarter ending June 30, 1923, carried 71,768,428 passengers compared with 69,882,601 in the preceding quarters, an increase of 1,885,827. The average number of cars operated during the quarter was 1,291 compared with 1,280 in the preceding quarter.

Earnings $3,090,287.—The American Light & Traction Company and its subsidiaries, for the twelve months ended June 30, 1923, have reported earnings of $3,090,287. This is after all charges, including depreciation, replacement reserves and preferred dividends. It is equivalent to $10.22 a share on the company's $30,040,400 common stock.

Wants Record of Mortgage Established.—The Williamsport Passenger Railway, Williamsport, Pa., has filed a notice in court to establish a record for a mortgage dated Dec. 15, 1866, executed to secure bonds of $10,000. No satisfaction of payment of the bonds has been established by record, the company going to court to establish the payment legally. The mortgage was made to Mahlon Fisher and B. H. Taylor, long deceased. The mortgage was given when the passenger railway still used horses.

Petitions on Valuation Rehearings Denied.—The Missouri Public Service Commission has denied the petitions of both the city of St. Louis and the United Railways requesting a rehearing in the railways valuation case. The commission fixed the valuation for rate-making purposes at $52,838,110. The city contended the value was too high and the company that it was too low. The company will ask the Cole County Circuit Court to review the findings of the commission.

Makes Offer on Claim.—The Jersey Central Traction Company, Keyport, N. J., which suspended operations on July 28 appeared before the Middlesex County Freeholders and offered them $600 on a $1,080 claim the county holds against the company for its franchise from 1917 to the present year. The matter was referred to county counsel. The agreement between the traction company and the county called for the payment of $180 yearly since 1903 for franchise rights.

Additional Holding Company Preferred Offered.—An additional issue of $2,750,000 of Electric Bond & Share Company 6 per cent cumulative preferred stock is being offered by Bonbright & Company, New York, N. Y., at 97½, to yield 6.15 per cent. The proceeds of the sale will be used for the expansion of the company's business. Upon completion of present financing total preferred stock authorized and outstanding will be $20,000,000 and total common stock $20,000,000. All the common stock is owned by the General Electric Company.

Transfer of Stock Approved. — The Board of Public Utility Commissioners of New Jersey recently approved the transfer to the Public Service Railway of the $250,000 capital stock of the Emergency Fleet Railway. The Emergency Fleet Company operated a line during the war to carry shipbuilders to their work at Camden. With the exception of the rolling stock and the power house the entire Emergency Fleet Railway lines were constructed by the Public Service Railway. The Emergency Fleet Railway operated a line between Gloucester City and Fairview.

Accepts Lease from City.—The trustees of the Boston Elevated Railway have accepted a lease from the city of Boston for the double-track line previously operated by the Eastern Massachusetts Street Railway in Hyde Park. The rental will be 4½ per cent on $235,000 which is the amount fixed by the Massachusetts Public Utilities Commission as the value of that portion of the Eastern Massachusetts system in Hyde Park. The line extends from the old boundary line to Cleary Square. As a result passengers can now ride from Cleary Square, Hyde Park, to any point on the elevated system for a single fare.

Traffic and Transportation

Receives Evidence

Interstate Commerce Commission Holds Hearing in Los Angeles on Proposed Plaza Union Terminal

The Interstate Commerce Commission, represented by Commissioner Clyde A. Aitchison on July 6, opened up in Los Angeles a hearing to receive evidence in support of the complaint of the city of Los Angeles. The city is seeking an order from the commission requiring the railroads to join in the elimination of the dangerous grade crossings along Alameda Street and the Los Angeles River and better serve the necessities and conveniences of the traveling public.

Plan to Accommodate Four Railroads

In previous hearings before the California State Railroad Commission the city of Los Angeles approved the Plaza Terminal plans of the commission's chief engineer, as compared with the Arcade Terminal plan submitted by the steam road and electric interurban lines.

At the hearing before the Interstate Commerce Commission Richard Sachse, former chief engineer of the State Railroad Commission, showed how he could construct his Plaza Terminal for approximately the same cost as the Arcade Terminal plan. Mr. Sachse stripped his plan down to actual physical necessities, claiming that his plan would accommodate four railroads, while the other plan would only take care of two lines. His original estimate for his terminal plan was $32,000,000, while his revised figures called for $7,350,700, while the carriers' plan called for a terminal costing $7,331,000.

Many Traffic Studies Made

Traffic studies by the city of Los Angeles Board of Public Utilities' engineers from the year 1918 to 1923 showed that there had been an increase of 136 per cent in the number of persons crossing in street cars the tracks of the steam road line on Alameda Street, which is one of the vital points in the city's fight to remove the steam road tracks from this thoroughfare in its proposed program of grade separations, which it claims can be accomplished by the construction of the Plaza Terminal.

Henry Z. Osborne, former chief engineer of the Los Angeles Board of Public Utilities and former chief engineer of the Los Angeles Traffic Commission, testified and cited results of his investigation of traffic conditions in Los Angeles since 1901 in support of the city's fight for the construction of the Union Plaza Terminal.

It was the belief of the commissioner representing the Interstate Commerce Commission that it would possibly be more than eighteen months before anything definite can come out of the proceedings now pending in the city's plaza terminal case.

Steam Roads Submit Revised Plan

An engineer of national repute was retained by the city to inquire into the matter. His testimony for the city's case outlined to the commission the type of union terminal needed for Los Angeles, comparing it with terminals at St. Louis and Kansas City. He planned that the Pacific Electric interurban lines should be required to come into the terminal through a subway, and that the entire terminal should be electrified, since that is the present trend of transportation.

Counsel for the three steam roads and the Pacific Electric lines in offering their plans in opposition to the city's Plaza terminal plan saw fit to withdraw the former plans known as the Titcomb plan, submitting a revised layout with many added features. The revised plans featured the construction of a new terminal station for the Pacific Electric lines at a point from 1,000 to 2,000 feet south of the Southern Pacific Company's present Arcade passenger station.

H. G. Weeks, transportation engineer of the State Railroad Commission, testified as to the needs of a union terminal, claiming the plans as outlined by the city did not seem unreasonable, owing to the rapid development of the community.

Paul Shoup, vice-president of the Southern Pacific lines and president of the Pacific Electric lines, took the stand in opposition to the city's Plaza union terminal plan, testifying that the plans of the defendants' traffic arrangement as suggested by the Southern Pacific-Union Pacific-Pacific Electric Companies would do away with all dangerous grade crossings along Alameda Street and at Los Angeles River, without the necessity of the construction of the terminal.

Safety Survey Placed Under Prof. Swain

Prof. George F. Swain has been placed in charge of the safety survey of the elevated lines in New York City to be made by the city. Prof. Swain is professor of civil engineering at Harvard University. He was formerly president of the American Society of Civil Engineers. According to tentative plans, the Brooklyn lines will be considered first and then the Manhattan overhead routes.

While this work is in progress another activity of the City Transit Bureau will deal with the surface lines. The City Transit Bureau is in charge of John H. Delaney, dock commissioner. This bureau has opened offices in the City Hall in charge of Frank Sinnott.

Jitney Status in Schenectady an Enigma

The Schenectady jitney situation is now in a muddle worse than has developed in any other similar situation. Supreme Court Justice Borst of Amsterdam on Aug. 4 set aside the order of the Schenectady County Judge McMullen which order had nullified the injunction order of Supreme Court Justice Angell restraining the operation of jitneys in Schenectady and vicinity but did not pass on the merits of the original order. As the matter now stands the merits of the original order will be heard at a special term of the Supreme Court on Aug. 11, either before Judge Borst, Judge Angell or possibly both justices.

What has really happened is that judicial courtesy has been offended and all judges being brothers no judge wishes to offend the other. Therefore, whatever merits the case may possess have been swallowed up in the matter of procedure. Probably never before did a county judge upset the order of a Supreme Court justice, although countless times county judges have issued or denied injunctions.

In the interval the jitneys continue to ply and it is extremely doubtful if any contempt orders of the original injunction will be served on any of the jitney operators in Schenectady until the legal aspect of the situation is thoroughly ironed out.

Injunction Against City of Birmingham Reinstated

The indications are that Birmingham jitneys will operate on the streets of the city until November anyway. It will take until that time before the courts can make a final decision of the case, and in the meantime an initiative election will be held.

Judge Lucien D. Gardner, of the Alabama Supreme Court, has reinstated an injunction against the city of Birmingham to prevent the city from putting the jitneys off the streets. Some days ago Judge William Walker of the Birmingham Circuit Court allowed the jitney owners a temporary injunction against the city. Recently, Judge Walker dissolved this injunction and the jitney owners took the matter to the Supreme Court. Judge Gardner allowed the reinstatement of the injunction pending an appeal to the Supreme Court on the matter.

In the meantime the people will be allowed to vote on the question as to whether they want jitneys. Since the passage of the city ordinance, which was to have gone into effect on July 1, thirty-one jitneys have surrendered their licenses. There are still more than 200 jitneys in operation and drivers say they will fight the city ordinance.

In the event the jitney owners win before the Supreme Court or at the election the city and the company will occupy the same positions as they did before the agreement was drawn and signed by both.

Traffic Campaign—Movement of the Hour

An intensive campaign to educate the people of Atlanta on the traffic laws of the city is being waged at present by the Georgia Railway & Power Company, and a complete survey of the traffic needs of the city is being made, as steps in the plan of co-operation between the city and the company following Atlanta City Council's recent action in imposing a $5,000 indemnity bond on jitney operators.

Several weeks ago, the traction company asked that the city take immediate steps to regulate jitneys and enforce traffic regulations, and promised in return to take care of the city's needs in transportation, providing this assistance was given to prevent possible decadence of the city's system.

The City Council of Atlanta accepted the proposals of the company and as a first step toward carrying out the agreement passed the ordinance limiting the activities of jitneys. A move, however, is now on foot in Atlanta to regulate jitneys on the basis of common carriers, subjecting them to the conditions which are imposed on the street railway.

The traffic campaign of the company is taking up each detail of the traffic laws one at a time—devoting space to the movement on the dash signs of the cars, on the inside car cards and in the street car publication, *Two Bells*. Civic organizations in Atlanta are joining in the campaign and recent newspaper articles and editorials indicate that interest is being awakened in Atlanta over the traffic situation.

Chicago "L" Redecorates

Hardly had the eyes of the loop shoppers and workers become accustomed to the brilliant colors recently placed on one of the down-town stations of the Chicago "L" than three trains, each representing a different road, made their appearance upon the loop during the morning rush hour of July 30 and further surprised the patrons and pedestrians with their attractive new dress. A rich deep orange is used above the belt rails with a light green below. The sash have also been painted green, giving the necessary relief above the belt rail to the brilliant orange. The work of repainting the cars has been going on secretly for some time in anticipation of the delivering of 100 new cars, but after three trains were completed it was found necessary to place the revamped rolling stock in service.

The stations, one of which has been completed, are done in the rich orange, trimmed in light green, resembling to some extent the rolling stock. Attractiveness, cleanliness, and advertising qualities are some of the features of the new colors. With the new paint job on the rolling stock, comes the new heading on the letterboards of the car indicating that "Chicago Elevated" will be the name of the new consolidated companies. An outline of the proposed consolidation now in process of negotiation was given in the ELECTRIC RAILWAY JOURNAL, issue of July 21, page 114.

10,000 Maps a Day Requested by Vancouver Public

The British Columbia Electric Railway, Vancouver, B. C., has recently issued a map of its Vancouver city lines, measuring 12 in. x 9 in. in two colors, with car routes and places of interest detailed on the back. Conductors on all city cars received a supply and were instructed to hand them only to passengers who requested them. In three days 30,000 maps were thus distributed, and since then through the same channel and the company's offices a further 10,000 have been distributed.

It is noteworthy that this distribution was obtained without a cent being spent in newspaper advertising. The only copy advertising the map was carried in the company's weekly publication, the *Buzzer* and by means of a card costing $15, displayed in the company's space in its own cars. The map was produced by the publicity department for the purpose of stimulating travel, but has had the effect of creating considerable good will, judging by the expressions of approval received.

The maps, which are printed on 24½ lb. bond, to give long life, cost slightly more than 1 cent each and are expected to prove the cheapest form of advertising transportation.

International Rejects Bailey Avenue Bus Franchise

The International Railway has rejected the one-year franchise offered by the Buffalo authorities for a bus line in Bailey Avenue. The traction company also sought a parallel permit for buses in Delaware Avenue at a 10-cent fare and a 3-cent charge for transfers. The Bailey Avenue franchise was limited to a 7-cent fare with free transfers. The company would not accept the Bailey Avenue franchise without the right to operate the Delaware Avenue line. Failure on the part of the International to accept the Bailey Avenue franchise led Mayor Schwab to issue temporary permits to the Van-Dyke Company to operate buses along this street in competition with the International Railway, which operates cars part of the distance along the avenue. Regular 10-minute service with a 10-cent fare was maintained for two weeks until the courts interfered because of an action started by the railway.

"Passengers Always Right"

The Dallas Railway is conducting a "Merchandising Transportation" campaign, in which the central idea is to educate trainmen and others who come in contact with the riding public to smile, be cheerful, obliging and pleasant in their relations with the public to the end that all who ride the street cars once may be persuaded to ride again. The campaign was planned and launched under the direction of Richard Meriwether, vice-president and general manager, and is in charge of C. J. Crampton, superintendent of safety. A committee of trainmen appointed to outline some rules for motormen and conductors has submitted some good suggestions which have been adopted. Chief among these is "Never dispute a passenger's word—the passenger is always right."

Tokens in Force.—The North Carolina Public Service Company, Greensboro, N. C., on July 1 started using the Johnson fare boxes and tokens. The cash fare is 7 cents, with four tokens for a quarter.

Freight Tariff Rates Filed.—Lake Shore Electric officials have filed tariff rates to Detroit and points north which will be effective for the beginning of freight service on electric roads out of Toledo, beginning Aug. 18. This was announced by J. F. Starkey, general passenger agent.

Petitions for Bus Routes.—The Logan Valley Bus Company, a subsidiary of the Altoona & Logan Valley Electric Railway, has applied for permission to start two new bus routes in the city of Altoona, Pa., as feeders to the traction line. The districts to be served recently petitioned for trolley service.

Picnic Well Attended.—Between 3,000 and 4,000 people attended the second annual picnic of the employees of the Wheeling Traction System on Aug. 2. The greatest interest manifested was in the annual first-aid contest under the direction of Martin Cowan, director of safety of the company.

Better Service Planned.—When the Ohio Valley Electric Railway, Huntington, W. Va., puts into service the new cars ordered some time ago the present schedules will be completely revised looking toward a better and more expeditous service. It is said that virtually all of the cars now in use will be discarded.

Reduced Tariff Announced.—J. P. Mehigan, local general agent for the Milwaukee Northern Electric Railway, announced recently a new reduced freight tariff between points on the Milwaukee Electric Railway & Light Company lines and the Milwaukee Northern Electric Railway in connection with the Eastern Wisconsin Electric Company line.

New Service Announced.—The Seattle & Rainier Valley Railway, failing in its efforts to close negotiations for new automobile buses with which it proposed to give a fifteen-minute service to the city limits, announced a fifteen-minute service on July 8 between Norfolk and the city limits by a shuttle car, connecting with the Rainier Beach cars. The service will be continued until some other plan is arranged.

"Pay-As-You-Leave" Car Giving Satisfactory Service.—The new type of turnstile car described in the ELECTRIC RAILWAY JOURNAL for Dec. 30, 1922, is now being operated by the New York

Railways over the Lexington Avenue route from the Ninety-ninth Street carhouse to the Battery. The car makes four trips a day. Passengers enter at both ends of the car without paying, but make their exit through turnstiles after depositing their fares.

Hearing on Abandonment and Bus Set.—There will be a hearing before Public Service Commissioner Parsons at Elmira, N. Y., on Aug. 20 on the application of the Elmira Water, Light & Railroad Company for approval of the declaration of abandonment of its Seneca Lake division between Horseheads and Watkins. Public hearing will be had on the same day on the petition of William Marshall for a certificate of convenience for the operation of a bus line between Elmira and Watkins.

Will Make Survey.—The City Commission of Oklahoma City has employed traction experts to make a complete survey of the lines of the Oklahoma City Railway showing its earnings and operating costs. This survey is the first step of the city government in its fight to restore the 5-cent fare. The city maintains that the traction company could be operated at a fair profit under a 5-cent fare now, if proper economies were practiced. Action is to be taken to compel the company to restore the 5-cent fare.

Safety First Meeting Held. — More than 500 persons attended the Safety First meeting held in the Ingomar Theater under the auspices of the Washington-Virginia Railway. The meeting was presided over by Thomas H. Travers, claim agent of the road and organizer of the Safety First committee of that road. An address to the employees was made by General Manager A. L. Reynolds and a short history of the inception of the safety first movement was given by Mr. Travers. An address on Safety First was delivered by J. M. Truitt member of the executive committee of the National Safety committee and a director of safety for the United Railways & Electric Company of Baltimore.

Safety Campaign Under Way.—The Chicago, North Shore & Milwaukee Railroad is conducting a novel safety campaign. Employees of the road and their friends are being supplied with small signs reading "This car stops at all railroad crossings." The sign, which is pasted on the windshield and on the back window of the automobile, is in red and immediately catches the eye of another driver, who will undoubtedly take note of it and will appreciate the necessity for such procedure. The company is also issuing a four-page pamphlet entitled "Some Safety Signs that Will Save Suffering and Sorrow." As a furtherance of the educational idea on safety first thousands of these circulars are being passed out to automobile owners traveling through this territory. Operators of all trucks and other vehicles are urged to follow the example set by the owners of private automobiles.

Book Reviews

Engineer Foundation Report

Annual report of the Engineering Foundation for year ended Feb. 8, 1923.

Engineer Foundation was established in 1914, based on a gift from Ambrose Swasey, designed as the nucleus of an endowment from many donors. The report shows a number of researches conducted of interest to the electric railway industry. They include an investigation of arch dams, fatigue of metals and the beginning of an investigation of the application of paint on wood, known as the wood-finishing investigation, and the graphitic corrosion of cast iron. Reference is also made in the report of the Division of Engineering, National Research Council, of the study of rail joints in which the American Electric Railway Association is interested, as entering the stage of active experimental work.

Kansas Court of Industrial Relations

Bulletin No. 322 of United States Bureau of Labor Statistics. Department of Labor, Washington, D. C.

This is an account of the industrial court law of Kansas, and its working, throughout the period that it has been in effect. The report gives the text of the law, which passed in 1920, a synopsis of the cases filed on the industrial side of the court during 1920 and 1921 showing the methods and principles adopted by the court in its various actions, and an account of the legal proceedings arising in connection with the attendance of witnesses before the court and other activities of the court. A résumé is also is also given of the annual reports which have been published and a bibliography of books and articles relating to the court is appended.

Sampling and Analysis of Coal, Coke and Byproducts

Methods of the chemists of the United States Steel Corporation. Published by the Bureau of Instruction, the Carnegie Steel Company, Pittsburgh, Pa.

The chemists' committee of the United States Steel Corporation is made up of the chief chemists of laboratories of the constituent companies organized into groups. One of these is the coal, coke and by-products group. From time to time each group collects from all the laboratories the methods of analysis common to its particular products, and selects the best, the compilation being carefully edited and issued in pamphlet or book form by the Bureau of Technical Instruction of the Corporation. for distribution among the laboratories. Owing to the authoritative nature of these publications, there has arisen a considerable demand for them outside the corporation and they are sold at a reasonable price.

The most extensive of these publications relates to coal, coke and by-products. It is a leather-bound book of 190 pages. A second edition has recently appeared which is substantially a new work. The work divides itself into two parts, as indicated by the title, the more valuable from the electric railway standpoint being the first. This embraces the sampling of coal and coke, physical tests and proximate analysis of these, analysis of coal and coke ash, ultimate analysis of coal, determination of the calorific value of coal and coke, etc. Obviously this work should be in the library of every electric railway which does chemical analysis on fuels.

Experiments on Loss of Head in Valves and Pipes of One-Half to Twelve Inches Diameter

By Charles I. Corp and Roland O. Ruble. University of Wisconsin, Engineering Series. Vol. IX, No. 1. University of Wisconsin Engineering Experiment Station, Madison, Wis.

A 143-page pamphlet giving the data secured in an elaborate series of experiments on gate and globe valves. The experimental methods are described and the data are presented in graphical and tabular form. Deductions are drawn as to the significance of the experiments.

An Investigation of the Fatigue of Metals

Bulletin 136, Engineering Experiment Station, University of Illinois. By H. F. Moore, research professor of engineering materials, and T. M. Jasper, research assistant professor of engineering materials. Published by the University of Illinois, Urbana, Ill.

This investigation was carried on through the co-operation of the National Research Council, Engineering Foundation, the General Electric Company and the Engineering Experiment Station of the University of Illinois. Bulletin 124 of the Experiment Station contains the first report of the tests made in connection with the present investigation.

Tests were made on specimens of wrought ferrous metal, kept under continuous series of cycles of stress in reversed bending, combined reversed bending and steady tension, and reversed torsion. A study of the test data tends to confirm the existence of an endurance limit for wrought ferrous metals, that may be determined with a fair degree of accuracy by a short-time test. The endurance limit seems to be correlated with the ultimate tensile strength, with the Brinall hardness number, and in a much smaller degree with the yield point, and the proportionate elastic limit. Tests of specimens for various temperatures of "draw" after oil-quenching indicate that for carbon steel neither the ultimate tensile strength, the endurance limit for flexure nor the ductility was appreciably affected by draws at a temperature lower than 600 deg. F.

Legal Notes

FEDERAL COURTS—*Assessment Against Street Railway for Paving Held Not to Deny Due Process or the Equal Protection of the Laws.*

An assessment of $102,942.30 against a street railway for paving between, and for 18 in. outside, its tracks, as authorized by Pub. Laws N. C. 1915, c.56, on failure of the company to make the improvement, was not arbitrary or wholly unreasonable, so as to constitute a taking of property without due process of law or a denial of the equal protection of the laws, in violation of the Fourteenth Amendment, though the company's property on the street had a value of only $100,000, while abutting property, against which an assessment of $89,909.58 was made on a front-foot basis, had an assessed value of $5,083,250, and though the company was put to an expense of $75,108.85 in taking up and relaying its track, and though its railway was being operated at a loss. The franchise of the company required it to bring its roadbed and track to surface grade at its own expense when required, and while imposing no liability for paving, granted no exemption from it. (Durham Public Service Co. vs. City of Durham, 43 Supreme Court Rep. 290.)

FEDERAL COURTS—*Members of Trade Union Held Not Entitled to Recover Under Order of Court of Industrial Relations.*

Where the court of industrial relations of the state of Kansas found wages were unjust and adjudged that a minimum wage scale be in force from a certain date and be continued for six months, its order in effect was a finding that wages were not unjust prior to such date and subsequent to the date of service of the summons in the proceeding. Hence members of a labor union were not entitled to recover increased rate wages for the time between the service of the summons and such date, while the order of the Court of Industrial Relations continued. Decision by Circuit Court of Appeals, Eighth Circuit. [Local Union No. 497 of Amalgamated Association of Street & Electric Railway Employees of America et al. vs. Joplin & Pittsburgh Ry., 287 Federal Rep. 474.]

GEORGIA—*Grant of Right to Construct, When Accepted, Binds Company to Operate on Terms Stated.*

A franchise granted by the Board of County Commissioners specified the routes to be operated, schedule to be maintained, etc. After the line had been operated for a number of years the company decided to abandon a portion of it on the ground that its operation was unprofitable, but citizens along the line obtained an injunction against abandonment. The court held that the company could not abandon a portion of the line while retaining and operating another portion under the grant. So long as the company retains any of the benefits it must perform all the obligations imposed by the contract. [Macon Railway & Light Co. vs. Corbin et al, 116 Southeastern Rep. 305.]

KANSAS—*Freight Charges for Transportation of Brick for Paving Purposes Not Lienable as for "Labor" or Labor Performed.*

The freight charges of a traction company for transporting certain carloads of brick to be used for the paving of public streets are not lienable claims as for labor within the meaning of the mechanic's lien act, nor do such freight charges fall within the terms of the bond which was given by the paving contractor to the city to secure the payment of all claims for labor which might be the basis of liens. [Union Traction Co. vs. Kansas Casualty & Surety Co., 213 Pacific Rep. 169.]

MICHIGAN—*Statute Giving Court Jurisdiction to Order Reinstatement of Veterans Removed from Public Employment Is Unconstitutional.*

This case arose when a lineman in the employ of the Street Railway Commission of Detroit was discharged in November, 1920. As a veteran he brought suit for reinstatement and payment of wages during the intervening time because of the Michigan law which declares that no veteran shall be removed from a public office or employment except after a full hearing as to his competency before the Circuit Court of the county where he is employed. He was reinstated under writ of mandamus, but the court refused to adjudicate the matter of money due him. The Supreme Court declared that the constitution of Michigan defines the duties of the court as judicial, whereas if a court is to pass intelligently upon whether a person is suited for employment in public work, the inquiry is administrative in its character and not judicial. Hence the law is unconstitutional. [Koeper vs. Street Railway Commission of Detroit, 193 Northwest. Rep. 221.]

MISSOURI—*Liable for Conductor's Assault on Passenger Unless in Self-Defense.*

As assault by a railroad employee on a passenger is entirely excused only when the passenger's provocative conduct is such as in law amounts to a justification of the assault on the ground of self-defense, but where less than this, evidence of provocation is admissible in mitigation of damages only. [Hunter vs. Kansas City Rys., 248 Southwest. Rep. 998.]

NEW JERSEY—*"Tracks" in a Paving Contract Meant Rails.*

Where a contract between a city and a street railway required the railway to pave that portion of the street "that lies inside of the rails of any of their tracks and 2 ft. outside thereof * * * and to keep certain parts of said streets so to be paved by them as aforesaid inside of their tracks at all times in good repair," the word "tracks" in this contract meant "rails." [City of Bayonne vs. Public Service Railway, 118 Atlantic Rep., 9.]

NEW JERSEY—*Duty of Motorman in Approaching Street Intersection.*

The rule in regard to street intersections is that it is the duty of the motorman to have his car so far under control that he will not endanger the safety of a vehicle, driven with reasonable care, which may happen to cross the tracks in front of the trolley car. A request to charge that "a motorman must expect that other vehicles will cross his tracks at intersecting streets, and must keep his car under control in order to avoid collision at those streets," was properly denied. It was too broad, since it placed improperly the whole burden of avoiding a collision upon the motorman of the trolley car, without any regard to the recklessness of the driver of the other vehicle. [Geyer et al vs. Public Service Ry., 120 Atlantic Rep. 186.]

NEW YORK—*In Rate Fixing, Valuation at a Pre-War Basis, Less Depreciation, and Exclusion of Certain Overhead Expenses, Held Improper.*

In a valuation to determine rates, it was error to use pre-war costs, less subsequent depreciation, and not consider the valuation during and after the war. It was also error to exclude preliminary legal, administration and engineering expenses for building a 60 mile extension on the theory that this work had been done by the company's regular staff and charged to operating expenses because the way in which these expenses were defrayed in the past affects past earnings, which have nothing to do in determining whether the present rate is confiscatory. [People ex rel. New York State Railways vs. Public Service Commission, 195 New York Sup., 174.]

PENNSYLVANIA—*Where a Passenger Transfers from One Car to Another He Must Look Out for Opened Doors.*

A passenger of a street car upon being requested to transfer to a car in the rear remains a passenger while walking from car to car. But where such a passenger walked so close to an intervening car that she was injured by the opening of door which protruded approximately 6 in., a directed verdict for defendant was warranted. The opening of the door itself was an entirely proper act, as the motorman was not bound to anticipate that a person would be walking within 6 in. of the car when there was a wide space beyond. [Swink et ux. vs. Philadelphia Rapid Transit Co., 120 Atlantic Rep. 827.]

Personal Items

William Walker With Shore Line

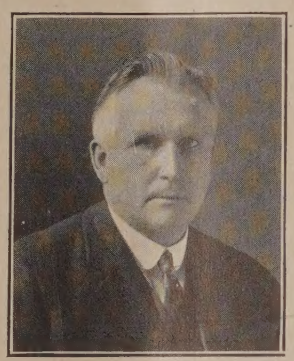
Former Hartford & Springfield Official Placed in Charge of Rehabilitated Property

Out of New Haven, Conn., there is now operating an electric railway which had long been shut down. It is the old Shore Line road, now under the management of William Walker. The road was conceived and constructed originally by the late Morton F. Plant. He saw a great future ahead for the territory skirting Long Island Sound between New Haven and New London, but before the road could be made to pay Mr. Plant died.

While he lived Mr. Plant's money was his own to do with as he liked. After he died there was another story. The executors of his estate promptly set about the work of cutting off ventures of his that had become a liability In this process the part of the Shore Line System previously referred to was shut down. And it remained shut down until July 17 of this year. On that date service was resumed under the direction of Mr. Walker by a new company, the New Haven & Shore Line Railway, headed by William A. Sperry, New Haven, and associates, no less enthusiastic about the possibilities of the road in the future than was Mr. Plant. They have opened the road from New Haven to Guilford and propose to extend operation soon from Guilford to Saybrook, 33 miles from New Haven.

The original road was well built, largely on its own private right-of-way. So far as the engineering work in connection with its rehabilitation was concerned the problems that presented themselves for solution were easy. The real questions were how to equip the road and how to run it so that the public might be served adequately and a profit made for the new owners. This is the problem that is now up to Mr. Walker. Nearly all his experience has been with roads confronted with problems somewhat similar to that now presented by the rehabilitated Shore line. He was formerly general manager of the Hartford & Springfield Street Railway, Warehouse Point, Conn., and for eight years before that he was superintendent of the Southbridge division of the Worcester (Mass.) Consolidated Street Railway.

He entered railway work as a conductor on the Schenectady Street Railway in 1894 and later served that company as inspector. His service with that company covered a period of ten years. He next was appointed a train dispatcher with the Berkshire Street Railway and a year later was transferred by that company to Westfield as an inspector of construction on the Western Massachusetts Street Railway. When the Western Massachusetts was placed in service Mr. Walker was appointed an inspector of transportation. He was next transferred from Westfield to Springfield in a similar capacity and later was made superintendent of the Blackstone Valley division of the Worcester Consolidated Street Railway. He



William Walker

was made superintendent of the company's Southbridge division in 1912. Other men there are with experience similar to that of Mr. Walker, but probably few with a wider range of experience than he in handling problems such as will undoubtedly be presented for settlement in connection with the operation of the Shore line and certainly very few, if any men, with a keener knowledge of the needs of the people of the territory served by the rehabilitated road.

A. C. Starkey Heads Railway Division—W. L. Clayton in Charge of Buses

Several changes in the personnel of the transportation department of the Indiana, Columbus & Eastern Traction Company were announced on Aug. 1 by C. C. Fast, general superintendent of transportation, from his offices in Springfield, Ohio.

Arthur C. Starkey, superintendent of the Springfield - Lima division, was placed in charge of all traction line operations on the Dayton-Columbus; Dayton-Union City, and Springfield-Lima divisions.

W. L. Clayton, formerly superintendent of the Dayton-Columbus division, will have control over all bus operations on the Dayton-Columbus and Springfield-Lake View divisions.

R. L. Jacobs, who has been superintendent of all bus lines of the Indiana, Columbus & Eastern Company, was transferred to Columbus to direct bus operations between Columbus and Grove City, and all bus operations of the Columbus and Zanesville line. He will serve under John W. Hewitt, general superintendent of the Columbus, Newark & Zanesville Electric Traction Company.

C. O. Strait, former dispatcher at Springfield, is stationed at Dayton as inspector in charge of Dayton freight operations and the Dayton-Union City traction division.

The placing of all bus operations on the I., C. & E. divisions under the direction of Mr. Clayton, Mr. Fast announced, is in recognition of the importance of this phase of the company's activities and also because under the new Freeman-Collister bus law, the bus is placed on a new status as an agent of transportation, "the company being fully awake to the possibilities of the situation."

W. R. Johnson has been appointed superintendent of the railway properties of the Menominee & Marinette Light & Traction Company, Menominee, Mich. He will succeed J. I. Searles, who lately left the company to become connected with the Lake Superior District Power Company's railway lines. Before taking up his new duties, Mr. Johnson was connected with the Wisconsin Public Service Corporation's railway and interurban lines in and near Green Bay. Before becoming associated with the Wisconsin Public Service Corporation, he was with the Chicago, Milwaukee & North Shore Railway in Milwaukee.

William Dineen, Madison, was appointed secretary of the Wisconsin Railroad Commission to succeed C. D. SeCheverell, who resigned to accept a position with the Middle West Utilities Company at Grand Island, Neb., as head of the utility company there. Mention was made of Mr. SeCheverell's resignation in the ELECTRIC RAILWAY JOURNAL issue of Aug. 4. For the past sixteen years Mr. Dineen has been connected with the commission, starting as office boy. For the past five years he has been chief clerk, a post in which he was called upon to do much commission detail work.

E. F. Schneider is back at work. His many friends will be glad to know that he is sufficiently recovered from his long and serious illness so that he can again undertake some work though limiting his responsibilities. It will be recalled that Mr. Schneider was formerly vice-president and general manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, and was most active in railway circles. He had to give up his connection with the Cleveland & Southwestern early in 1921 on account of his illness. At present he is doing some work in the claim department of the Cleveland Railway. He attended the summer meeting of the Central Electric Railway Association held recently at Cedar Point and was welcomed back by his many friends in this territory. He was president of the Central Electric Railway Association 1914-1915.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Coal Crisis Imminent

Strike in Anthracite Field May Be Followed By Sympathetic Bituminous Strike—Coal Commission Reports

A very serious situation exists in regard to the coal supply. This fact is set forth in a letter sent under date of Aug. 7 to the member companies of the American Electric Railway Association. According to this circular letter, signed by J. W. Welsh, secretary, many people regard a strike on Sept. 1 in the anthracite coal field as inevitable. They predict that a sympathetic strike in the bituminous field may follow.

It is stated that the American Electric Railway Association is co-operating with the Joint Fuel Committee under the chairmanship of John W. Lieb, and every possible assistance will be rendered to the member companies. "We cannot urge too strongly," states the latter "that all electric railway managements take immediate steps toward increasing their fuel supplies to the maximum of storage capacity. The time to begin is now."

PRESIDENT COOLIDGE IN CONFERENCE

What steps, if any, the new administration plans to take in order to avert a tie-up are unknown. A conference between President Coolidge and a representative of the Federal Coal Commission has been held, however, and the President is thoroughly conversant with the situation. It is understood that he firmly indorses the report of the commission.

The anthracite wage agreement expires on Sept. 1. After four weeks of conference at Atlantic City between representatives of the United Mine Workers and the anthracite operators, all negotiations have been called off. The particular cause of the deadlock was the miners insistence upon the check-off and the refusal of the operators to grant it. It is declared that John L. Lewis, president of the United Mine Workers, will insist upon the granting of the check-off or will call a strike. It is further stated that anthracite operators will make no effort to break a strike should one be declared by the men.

Bituminous wage agreements include the check-off and the funds received from it would go to help finance strikers in the anthracite field. It is upon this fact that prediction of a sympathetic strike by the miners in the bituminous field is based.

REPORT OF THE COMMISSION

The United States Coal Commission made public on Tuesday, Aug. 7, a supplemental report on labor conditions in the anthracite industry, containing twelve recommendations for bringing about peace. The recommendation that the President should have the right by law to prevent a coal strike is in line with the previous recommendation of this body. Compulsory arbitration is declared to be no remedy. The check-off which is one of the outstanding issues in the present controversy is not mentioned in the report. Both sides are again condemned for the loose and misleading statements which they have given to the public. Other recommendations made in the report are very similar to those contained in the preliminary report of the commission published in ELECTRIC RAILWAY JOURNAL for July 14, page 56.

$1,000,000 Contract Awarded by Ford's Road

Preparations are now under way for the electrification of the first unit of the Detroit, Toledo & Ironton Railroad. Contracts aggregating $1,000,000 have been awarded to the Westinghouse Electric & Manufacturing Company for the construction of equipment and rolling stock. The original capacity of the Rouge power house is being doubled. The present two 12,500-kw. turbo-generators are being replaced by eight turbo-generators of 30,000 kva. capacity each. One of these turbines is already nearing completion.

The electric locomotives will weigh 350 tons. They will have a normal capacity of 4,000 hp., and a one hour capacity of 5,000 hp. Sixteen driving axles will develop 108,000 pounds drawbar pull at 25 m.p.h. The maximum speed will be 45 h.p.h.

In addition to the rehabilitation of the power plant and the construction of locomotives, 13¼ miles of double track will be built between the River Rouge plant and the Flat Rock yards. Many other minor improvements are contemplated.

It has been Mr. Ford's goal from the first to electrify the road. Many rumors to this effect have been current in the past, but the first official announcement of them was made in the "D. T. & I. News" recently as noted in the ELECTRIC RAILWAY JOURNAL for July 28, page 153.

Thirty-Year History Compiled

A review of thirty years' history of the General Electric Company, from its foundation in 1892 to 1922, is made the subject of a thirty-four-page booklet just issued to the company's stockholders. Tracing the development which grew out of the early pioneering work of the Edison General Electric Company, and the Thomson-Houston Electric Company, the growth of the business and the constantly widening application of electric power are pictured.

The following are the principal headings: "Large Scale Power Generation," "Power on the Sea," "The Trackless Trolley," "At the Panama Canal," "Contributions to Long-Distance Wireless Communication," "Lightening Home Burdens," "Far-Reaching Aid to Medical Science," "Progress in Illumination," "A Great Necessity at a Small Expense," "One Million Volts," "Prices Increased Less than the Average," "How G-E Money Is Spent," "Opportunities for the Future."

Overproduction of Oil

It was recently announced that many oil refineries in the mid-continent field intended to suspend operations during a period of several weeks. The principal wells of this field are located in the bordering states of Texas, Oklahoma and Kansas.

An unprecedented surplus now existing was given as the reason for this move. Rather than suffer a price reduction which would make it impossible to sell at a profit the refiners discussed the idea of shutting down their plants until the surplus had been absorbed. So far as is known, no effort has yet been made to carry out this move. It is felt that Government intervention might occur in case the attempt were made.

Although a somewhat general condition of overproduction exists, many of the large oil companies are taking no part in this proceeding. For several months past the capacity of the pipe lines and the storage capacity at tidewater has been severely taxed. For this reason there has been little attempt made to drill new wells. It has been thought better to hold back until the present supplies have been further absorbed.

In any case, lubricating oils probably will be little affected. Many of these oils are made from a Pennsylvania paraffine base and a shutdown on account of overproduction in the mid-continent field would have no bearing upon the situation in the Pennsylvania oil field.

Metal, Coal and Material Prices

Metals—New York	Aug. 7, 1923
Copper, electrolytic, cents per lb	14.312
Copper wire base, cents per lb	17.125
Lead, cents per lb	6.525
Zinc, cents per lb	6.50
Tin, Straits, cents per lb	38.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$5.375
Somerset mine run, Boston, net tons	2.625
Pittsburgh mine run, Pittsburgh, net tons	2.075
Franklin, Ill., screenings, Chicago, net tons	1.65
Central, Ill., screenings, Chicago, net tons	1.375
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.00
Weatherproof wire base, N. Y., cents per lb.	18.75
Cement, Chicago net prices, without bags	$2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.02
White lead, in oil (100-lb. keg), N. Y., cents per lb	11.85
Turpentine, (bbl. lots), N.Y., per gal	$0.95

Rolling Stock

Danville Traction & Power Company, Danville, Va., has received five sets of Taylor reduced height trucks equipped with Taylor straight action brakes for use on its new cars.

Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., is expecting delivery this month on the fifteen special safety cars which were ordered in March from the Perley A. Thomas Car Company of High Point, N. C. For these new cars the Taylor Electric Truck Company has made a shipment of its reduced height trucks with Taylor straight action brakes.

Georgia Railway & Power Company, Atlanta, will expect delivery next December of the twenty cars ordered several months ago. The specifications of these cars are as follows:

Builder of car body	Georgia Railway & Power Company
Type of car	Closed
Seating capacity	48
Total weight	37,000 lb.
Bolster centers, length	20 ft. 6 in.
Length over all	44 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	12 ft. 2 in.
Body	Steel
Headlining, Roof	Arch
Air brakes	Westinghouse-DH 16 Compr.
Armature bearings	Sleeve
Axles	4 in., heat treated
Bumpers	Channel
Car signal system	Consolidated
Car trimmings	Dayton Manufacturing Company
Center and side bearings	McGuire-Cummings
Conduits and junction boxes	Metal
Control	G-E., PC. 5
Couplers	Tomlinson, Form 10
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Designation signs	Keystone
Door operating mechanism	Manual
Fare boxes	None
Fenders or wheelguards	Atlanta—Similar to H-B
Gears and pinions	G-E, Grade M.
Hand brakes	Ackley, Staffless
Heater equipment	Consolidated
Headlights	Golden Ray & Golden Glow
Journal boxes	McG., MCB
Lightning arresters	Aluminum Cell
Motors, type and number	4-GE—265-A
Motors, outside or inside hung	Inside
Paint	Paint and varnish
Registers	Ohmer
Sanders	O-B
Sash fixtures	Dayton Manufacturing Company
Seats	Hale & Kilburn
Seating material	Rattan Filled
Slack adjuster	American
Step treads	Kass & Feralun
Trolley catchers or retrievers	O-B
Trolley base	O-B, Form 1
Trolley	Wheel
Trucks	McGuire-Cummings Company
Ventilators	Nichols-Lintern
Wheels (type and size)	26 in. Cast. chilled

Louisville Railway has announced the specifications for the fifteen new cars and twenty-five trailers recently ordered and mentioned in these columns previously. The detailed specifications of the cars follow:

Date order was placed	July 5, 1923
Date of delivery	Nov. 1-15, 1923
Builder of car body	G. C. Kuhlman Car Co.
Type of car	Peter Witt D.Ent. D.Exit. Double Truck Four Motor
Seating capacity	46
Total weight	36,900 lb.
Bolster centers, length	22 ft. 6 in.
Length over all	45 ft. 1⅞ in.
Width over all	8 ft. 2 in.
Body	All steel
Interior trim	Birch
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse, T. B. Co. Straight
Bumpers	Angle iron
Car signal system	Consolidated Car Heating Company
Center and side bearings	Brill
Control	G.E. "K"
Couplers	Tomlinson No. 6
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Designation signs	Dash signs only
Door operating mechanism	National Pneumatic Company front platform, hand-operated center.
Fenders or wheelguards	Louisville Railway Company
Fare boxes	Louisville Railway Company
Gears and pinions	General Electric Company
Hand brakes	Quick release, ratchet handle
Heater equipment	Cutler-Hammer Company
Headlights	Ohio Brass Company
Journal bearings	Plain
Journal boxes	Brill
Lightning arresters	General Electric Company
Motors, type and number	4-G.E. 247-I
Motors, outside or inside hung	Inside
Paint	Enamel
Registers	International Register Company
Sanders	Ohio Brass Company No. 13,797
Sash fixtures	Edwards
Seats	Brill
Seating material	Wood Slat
Springs	Brill
Step treads	Feralum
Trolley catchers or retrievers	Ohio Brass Company
Trolley base	General Electric Company
Trucks	Brill
Wheels	26-in. F. C. S. Griffin

The specifications of the trailers are as follows:

Date order was placed	July 5, 1923
Date of delivery	Nov. 10-30, 1923
Builder of car body	G. C. Kuhlman Car Company
Type of car	Center entrance; pay as you pass
Seating capacity	60
Total weight	25,000 lb.
Bolster centers, length	23 ft. 7½ in.
Length over all	46 ft. 8¾ in.
Width over all	8 ft. 2 in.
Body	All steel
Interior trim	Birch
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse T. B. Company
Bumpers	Angle iron
Car signal system	Consolidated Car Heating Company
Couplers	Tomlinson No. 6
Curtain fixtures	No curtains
Designation signs	None
Door operating mechanism	Hand operated
Fare Boxes	Louisville Railway Company
Fenders or wheelguards	Louisville Railway Company
Gears and pinions	G E.
Hand brakes	Quick release, ratchet handle
Heater equipment	Cutler-Hammer
Headlights	O. B.
Journal bearings (if ball or roller)	Plain
Journal boxes	Brill
Lightning arresters	G.F.
Paint	Enamel
Registers	International Register Company
Sanders	O. B. Company
Sash fixtures	Edwards
Seats	Brill
Seating material	Wood Slat
Springs	Brill
Step treads	Feralun
Trucks	Brill
Ventilators	Brill
Wheels (type and size)	26-in. F. C. S. Griffin

Track and Line

Elmira Water, Light & Railroad Company, Elmira, N. Y., has been engaged in an extensive program of track reconstruction. The plan includes new track and paving on east and west Miller Streets, Maple Avenue, west Third Street and Railroad Avenue and south Main Street.

Capital Traction Company, Washington, D. C., will soon start work improving the old car line from Chevy Chase Lake to Kensington. Under the lease by which the Kensington Railway passed into the hands of the Capital Traction Company it was agreed that the leasing company would improve the roadbed and operate modern cars over it.

Altoona & Logan Valley Electric Railway, Altoona, Pa., has started work on the construction of 2 miles of double-track. About $40,000 will be spent. The company will extend the double track from Ramey's to Ale's station, 1.3 miles and from Buena Vista to Tipton, a distance of 1 mile. The division has double track at present from East Altoona to Ramey's, a distance of 3 miles. A contract has been awarded to E. L. Grannas for excavation and filling in work necessary for the second track. The trolley company is doing the track laying work. Thirty foot "T" rails are being used. This construction is in line with the company's expectation that patronage will increase through the construction of the $250,000 board automobile speedway at Tipton.

Power Houses, Shops and Buildings

Trenton & Mercer County Traction Corporation, Trenton, N. J., will purchase a plot of ground on East State Street between Cuylet and Walter Avenue, and erect a carhouse there. Permission has been obtained to use the plot for a carhouse.

Sioux City Gas & Electric Company has postponed the construction of the proposed $3,000,000 power plant which was to have been completed and ready for operation in 1924. High prices of material and equipment are the reasons for deferring this construction.

Georgia Railway & Power Company, Atlanta, has ordered one 3,000-kw. 600-volt d.c. motor-generator set and switchboard for the Stewart Avenue substation. The coal and ash-handling equipment and automatic stokers for the Davis Street plant and Butler Street plant have already been ordered.

Philadelphia Rapid Transit Company will soon start on its building program which in addition to the new southern carhouse includes the construction of new and modern shops on Tenth Street and Erie Avenue. The new southern carhouse will be located on the property acquired by the company from the Girard Estate lying between Nineteenth and Twentieth Streets, Moyamensing Avenue and Johnson Street. It will accommodate more than 400 cars and will cost about $1,300,000.

Olean, Bradford & Salamanca Railway, Olean, N. Y., will soon move its office and waiting room from the head of Main Street, in Bradford, to the Erie Railroad depot there. With the removal of the offices, the work will be started on the installation of a switch on to the tracks of the Erie which will make the railroad depot the terminus of the traction lines. This change will help in relieving the congestion along Main Street, by diverting all freight cars on to the railroad tracks and leaving the depot for loading and unloading of freight cargoes. This move is part of the retrenchment policy of the company.